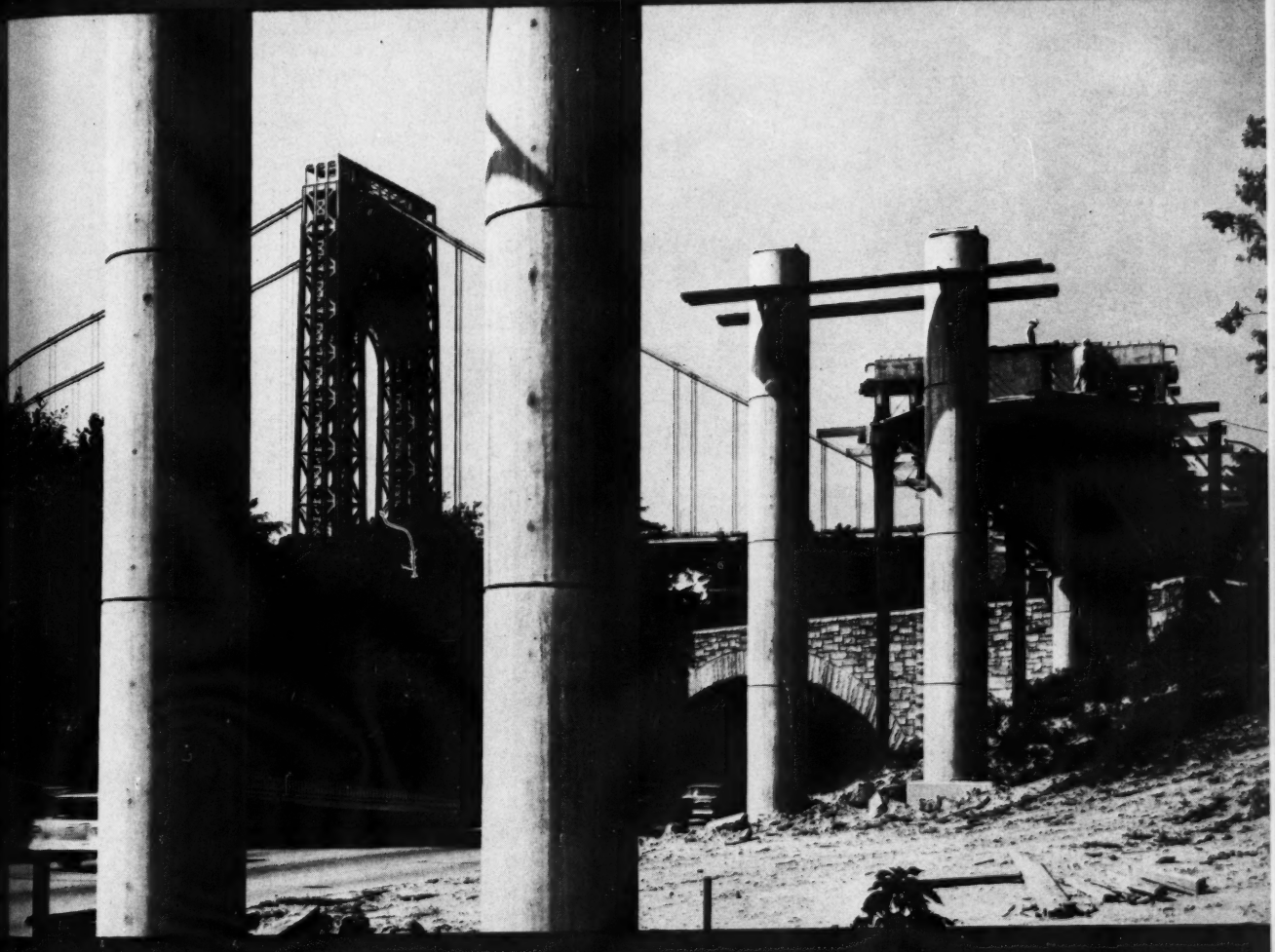
AUGUST 1958

TRAFFIC ENGINEERING



INSTITUTE OF TRAFFIC ENGINEERS
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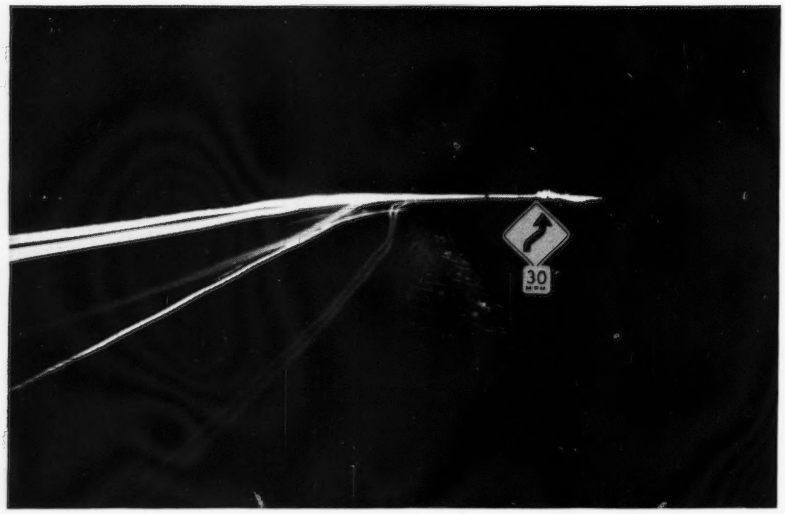
Why over 700 cities and counties get better signing at lower cost



With a vacuum applicator in your sign shop, you can make all types of professional traffic signs for roads and streets—reflective signs that guide motorists safely and surely day and night.

Fabrication of professional traffic signs with an automatic vacuum applicator is the method now in use by over seven hundred cities and counties to get better signing at lower cost.

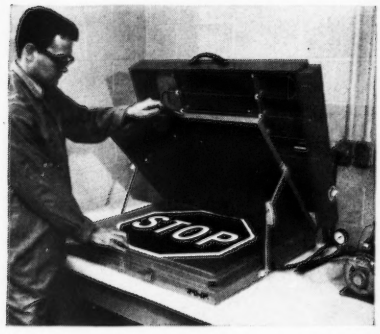
The starting point for savings is refurbishing old signs right in your own shop. You can give your old signs new faces in a matter of minutes in an applicator... and actually, you can switch over to red stop signs for as little as $3.60 per sign.

For additional savings, look at those projects you have wanted to start but, perhaps, put off because you thought they might be too costly. Projects like new reflective street name signs, hazard markers—distinctive trailblazers and guide signs that direct motorists day and night for city parkways or county roads. Faces for these signs can be made to order for you at lower cost than you think. All you have to do is apply the face to your sign blank in your applicator. Takes only five minutes.

For instance, you can reflectorize street or road name signs in a 3′ x 4′ applicator that turns out 10 or more of these 6″ x 24″ signs every five minutes.

Or you can make 8″ x 36″ bridge end markers to reduce the danger of darkness with any bridge hazard in your area—for as little as $1.95 per marker face.

Important, too, is the fact that operating an applicator is so simple you don't need specially trained men to make reflective signs. Production is fast—so you won't need extra people in your sign shop even during the busy spring season. When maintenance crews are idled by weather conditions their time can be more fully utilized by sign making jobs in the shop.



Vacuum applicators are available in a variety of sizes—including this new, table top "Economist" model. Designed for small shops, it produces nine 24″ x 24″ reflectorized signs per hour at low cost.

Your 3M Representative can tell you more about how to get the most out of your vacuum applicator—to put more into your signing program. You can get complete information by writing: 3M Company, Dept. RBI-89, St. Paul 6, Minnesota.

Anyone can operate a vacuum applicator—no special training is needed. You can make signs any time you need them—and give your community better safety with better signing at low cost.

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PRELIMINARY PROGRAM

29th Annual Meeting, Institute of Traffic Engineers

Commodore Hotel, New York City

September 14 - 17, 1959

Monday, September 14

Morning . . . . Welcome — Response
Matson Memorial Award Paper
ITE Past Presidents' Award Paper

Noon . . . . . **Luncheon** — Speaker: T. T. Wiley

Afternoon . . . "Operational and Planning Aspects of Urban Trafficways"
—The City's Responsibility, by S. S. Taylor, General Manager, Los Angeles Dept. of Traffic
—The State's Responsibility, by Rex M. Whitton, Chief Engineer, Missouri State Highway Department
—The Planner's Responsibility, by Robert F. Van Hoef, Community Planning Specialist, Michigan State Highway Department
—*an example*, "The Second Deck on the George Washington Bridge," by Edward S. Olcott, Port of New York Authority

Tuesday, September 15

Morning . . . . **Technical Committee Meetings** *(open meetings)*

Afternoon . . . **Annual Business Meeting**

Wednesday, September 16

Morning . . . . **Meetings of Technical Departments Nos. 1, 3 and 4**
Uniformity of Devices
Proposed Law and Ordinance Improvements Generated by the Interstate Highway System
New Developments in Roadway Lighting
Professional Role of the Traffic Engineer and the Planner
School Crossing Protection
Speed Zones
Warrants for Pedestrian Signals
Warrants for Yield Signs
Warrants for Four-Way Stops

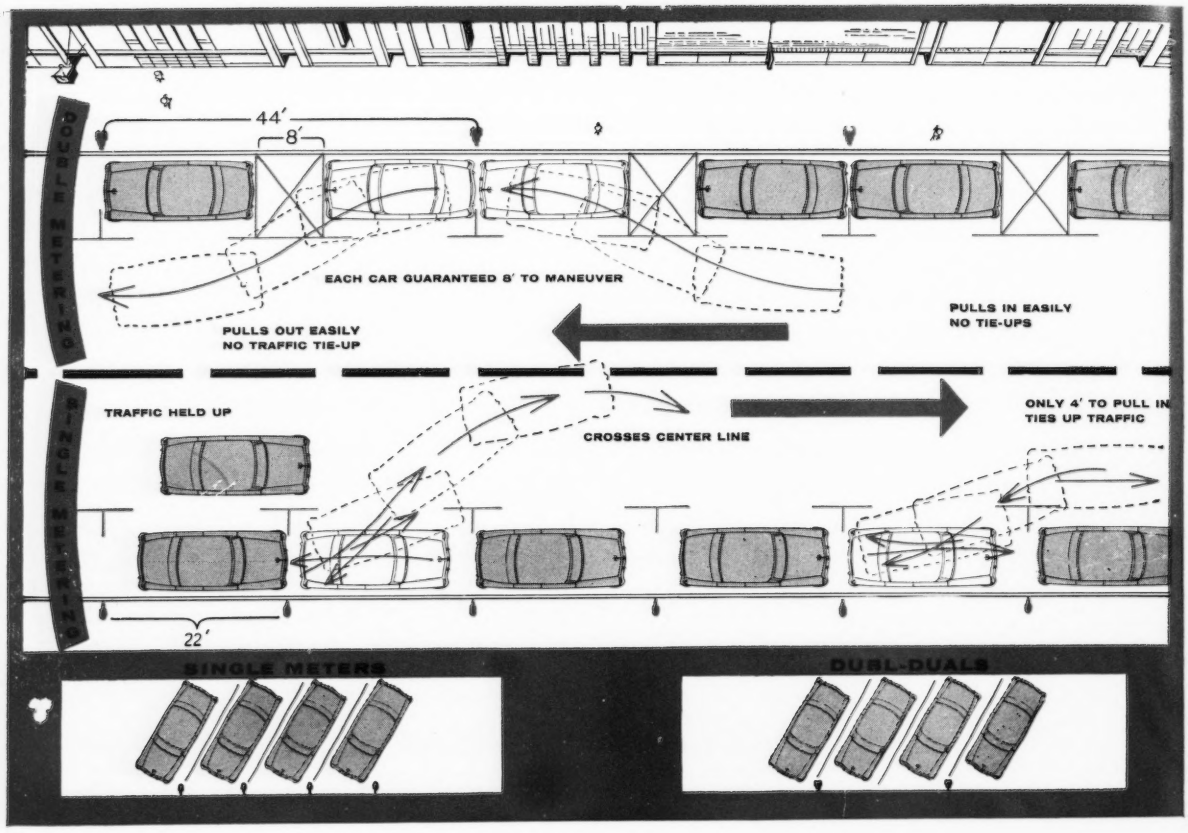
Afternoon . . . **Meetings of Technical Departments Nos. 2, 5, 6 and 7**
ITE Membership Survey
The Yale Study of Urban Transportation Administration
Civil Service Requirements and Exams for Traffic Engineering Positions
Freeway Design as Affected by Costs
Channelization Design
A Policy on Urban and Rural Driveway Control
Planning Criteria for Traffic Ways
Garage Operating Costs
Bus Stops on Expressways
Airport Parking Facilities
Pedestrian Signal Problems
Internally Illuminated Signs
Sign Supports
Traffic Signal Lens Colors
Paint Specifications for Smaller Communities
Traffic Survey Devices

Evening . . . . **Annual Banquet**

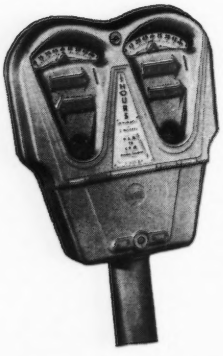
Thursday, September 17

Morning . . . . **Post Convention Tour—New York Harbor**

HOW TO MAKE THE MOST OF EXISTING PARKING SPACE



Only Dubl-Duals get the most out of existing parking space and reduce metering costs 27% in the bargain



The drawing above shows clearly how Dubl-Dual Parking Meters insure eight full feet between cars while single meters often reduce space to only four feet. Note too how traffic flows more easily and safely when cars are assured adequate room to maneuver into and out of the parking spaces.

But greater utilization of parking space is only part of the Dubl-Dual story. Since Dubl-Duals are two separate meter mechanisms in a single case, initial cost is lower. And installation costs are reduced because only half as many meter stand installations are required. Dubl-Duals also reduce collection and inspection time . . . every other meter "stop" is eliminated.

There are lots of sound, proven reasons why your community should investigate the economy and efficiency of Dubl-Dual metering. Send the coupon for complete details in the new, booklet on Dubl-Dual Parking Meters. Dual Parking Meter Co., Subsidiary of Rockwell Manufacturing Co., Pittsburgh 8, Pa.

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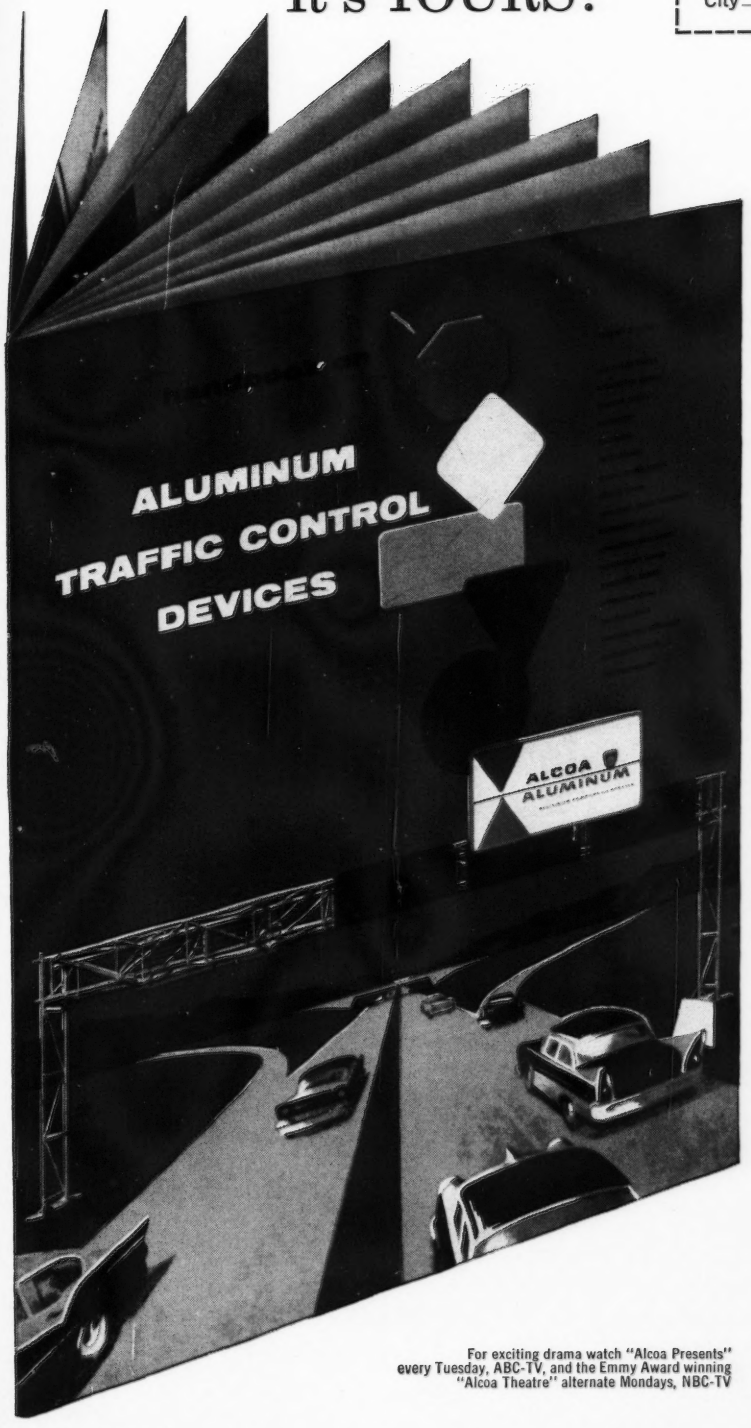

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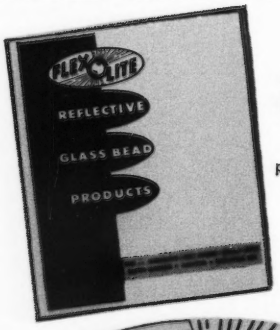

Write today for free booklet. Contains test and specification data, application procedures, and other helpful information.

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TRAFFIC ENGINEERING

OFFICIAL PUBLICATION OF THE INSTITUTE OF TRAFFIC ENGINEERS

Vol. 29 AUGUST, 1959 Number 11

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COVER: A view of the expanded New York approach system for the lower level of the George Washington Bridge under construction by The Port of New York Authority. Addition of the six-lane lower deck will increase the capacity of the eight-lane bridge to 63,000,000 vehicles a year traveling between New Jersey and New York across the Hudson River. The lower level will be opened to traffic in 1962.
—Photo courtsey of Port of New York Authority

TRAFFIC ENGINEERING is published monthly by the Institute of Traffic Engineers. Editorial offices are at 2029 K Street NW, Washington 6, D.C. Advertising plates should be sent to Interstate Printing Corp., 400 Watchung Avenue, Plainfield, N. J. Advertising representatives: New York—Seymour A. Robbins & Associates, 489 Fifth Avenue, N. Y. 17. Chicago—Scott Kingwill & Associates, 35 E. Wacker Drive, Chicago 1. Los Angeles—Jess M. Laughlin Co., 3142 Wilshire Blvd., Los Angeles 5. Entered as second-class matter November 7, 1941, at the Post Office at Plainfield, New Jersey, under Act of March 3, 1879. ¶Single copies 50 cents, subscription price $4.50 per year in the United States and Canada; $5.75 per year to foreign countries.

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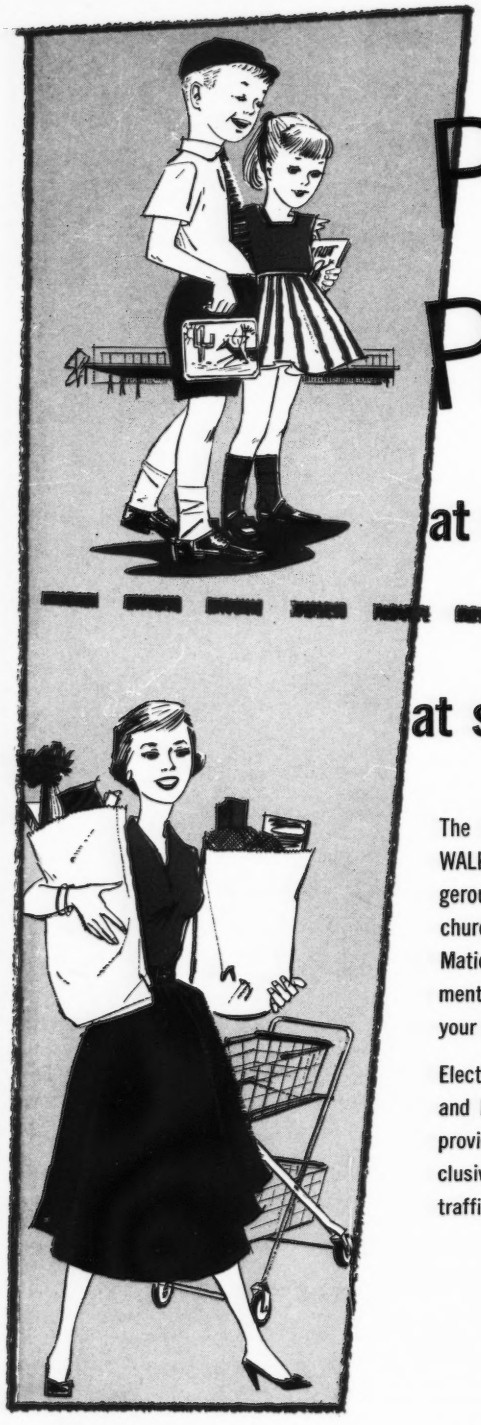
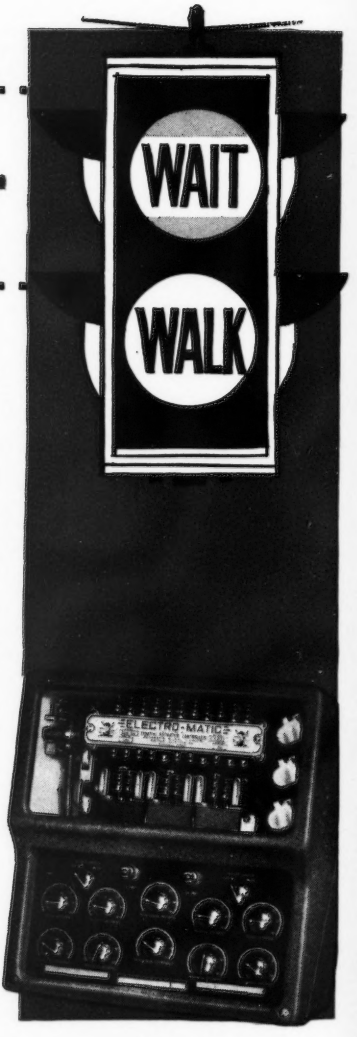


PROTECTING PEDESTRIANS

at school crossings..

at shopping centers..



The touch of a button gives pedestrians WALK protection at intersections with dangerously heavy vehicle traffic. At schools, churches, and shopping centers, Electro-Matic® Controllers and accessory equipment provides safe, efficient solutions to your pedestrian problems.

Electro-Matic Semi-Actuated Model 824DN and Full-Actuated Model 825DN Controllers provide a callable WALK period for the exclusive use of pedestrians, free from all traffic interference.

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AUTOMATIC SIGNAL DIVISION

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Frankly Speaking . . .

TRAFFIC ENGINEERS, you and your working knowledge are of paramount importance to the world today! Your specialized services are urgently needed in countless areas and in many countries; therefore, you are urged to exert every device known to you to diligently and tirelessly fulfill this need.

Because of the overabundance of traffic problems facing your undermanned profession today, you can contribute greatly by doubling your efforts and increasing your work time wherever and whenever you can, at least until such time as a sufficient increase in trained personnel can be realized.

Many of you, no doubt, are already doing so—some even beyond reasonable limits—yet, from the rest, more help is needed.

During my heavy travel schedule in recent years, I have found there exists a deplorable need for traffic engineering counsel everywhere. Actually, only one city or municipality in twenty-five benefits from the services of a full-time traffic engineer. Many cannot afford such aid, yet regardless of size they need it as a result of the impingement of modern expressways, beltways, major shopping centers, concentrations of suburban industry traffic, etc. Even many State and County traffic engineering staffs are still undermanned.

How can you help? There are a number of ways—the first already outlined above; work harder, give more of yourself to your present job. This will relieve some of the shortage. You can also provide much needed emergency relief to the many unfortunate cities who do not have, or who are too small to be able to afford, a full time traffic engineer. You can do this by taking leadership in forming local or metropolitan traffic engineering committees. Many knotty problems, some of substantial importance, can be solved by such a group. In addition, this committee, with your leadership, can act in the manner of a radar unit by recognizing impending problems and recommending corrective action. If such a committee is already in existence, pitch in, volunteer to serve and do it.

Problem subjects which will require your attention will be many. However, you should not be surprised to find parking, accelerated highway building, and high accident locations among the more common. Suburban area municipalities surrounding some of the more progressive large cities are now being faced with the threat of a relatively new problem—the so-called "new-fangled" electronic controls and equipment. They are at a loss as to how to cope with these developments. Here, too, you can help. You won't have to seek far to find other problems.

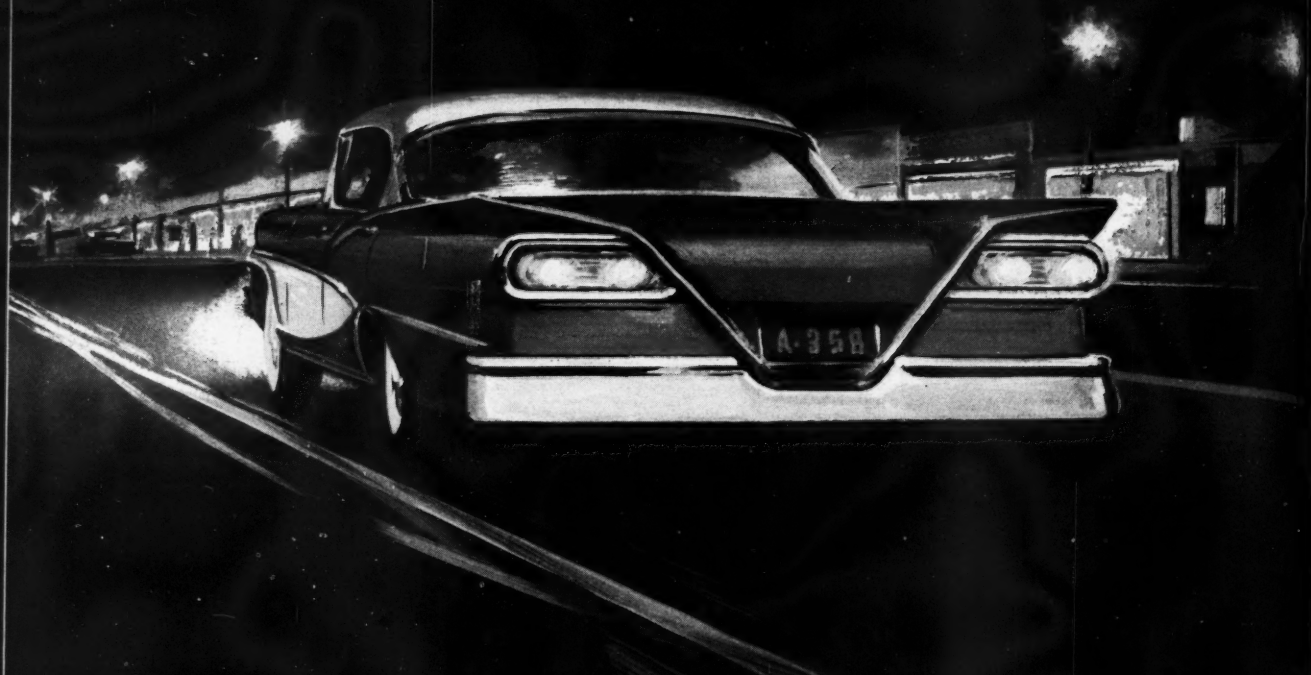
On May 21st and 22nd your ITE President Matt Sielski and 65 of your own hand-picked delegates conducted an outstanding "workshop" meeting. You have already been advised of some of the most encouraging accomplishments of this distinguished, hard working task force. As a result, the machinery is in motion to strengthen the qualities, aims, and effectiveness of our Institute of Traffic Engineers as a whole. It is now up to each of us to take a personal inventory. Ask yourself these questions while you are doing it:

1. Am I doing my very best to be a credit to my profession? Can I do more?
2. Am I fulfilling my moral responsibility to my own community or to other needy nearby municipalities? If not, how can I do so?

Only YOU will know the answer to these and other questions. It's up to each of you to reappraise, reevaluate, and plot your future course of action.

EUGENE A. BARTON
Director, District 3

Next time ... Stripe with *Cataline* ...



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Building For Traffic in the New York Area

By Robert Moses
City Construction Co-Ordinator
New York, New York

HERE, IN THE metropolitan area of New York, we are still engaged in a stubborn struggle to provide adequate arterials and other highway facilities for the constantly increasing output of the motor vehicle manufacturers.

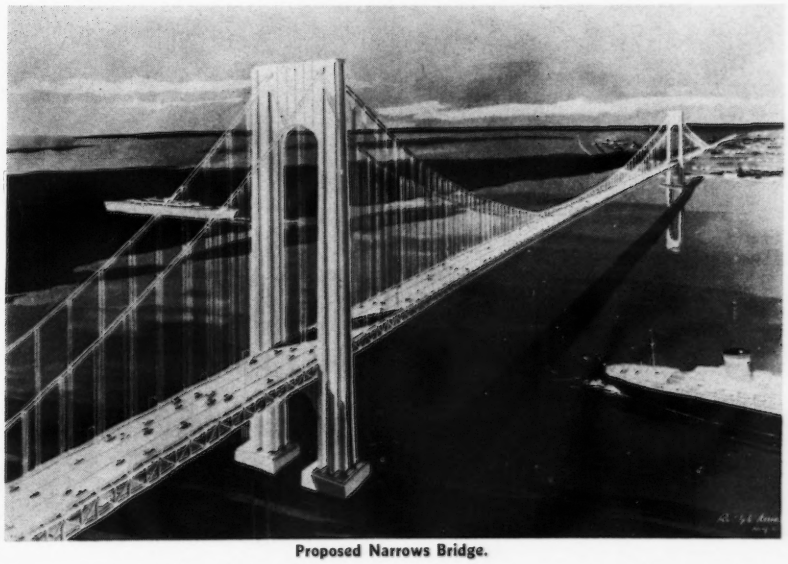
As every traffic engineer knows, population gains and shifts, rising costs of land, materials and labor, public apathy and often active bitter opposition to such vital improvements, combined with the lack of militant local leadership, complicate the task of planners and builders so that only those with stubborn tenacity remain undiscouraged and reasonably optimistic.

In the New York region, bucking the tide of spreading and growing population, car pools and Detroit automation, we are engaged in a comprehensive arterial construction program designed to provide the area with an up-to-date network of highways, parkways, expressways and other traffic facilities that will enable us to keep our metropolitan head above the car tops.

This struggle is not new. It has been going on for a generation ever since the motor vehicle became a major factor in our economy and indispensable to the average family.

The New York area, mind you, already has a network of fine parkways and water crossings.

In fact we pioneered the parkway with the construction of the Bronx River Parkway in 1924. Spanning the Hudson River we have the Holland and Lincoln Tunnels and the George Washington Bridge linking the state of New York with New Jersey. The Brooklyn-Battery Tunnel connects downtown Manhattan with Brooklyn

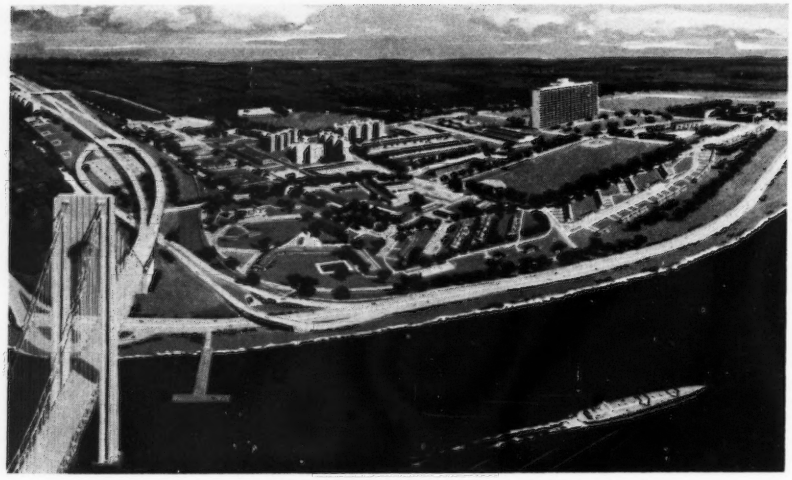


Proposed Narrows Bridge.

arterials while the Triborough and Bronx-Whitestone Bridges feed vehicular traffic to and from Long Island. The Queens-Midtown Tunnel carries traffic from the heart of Manhattan to the far reaches of Long Island. All of these facilities are connected with broad parkways and expressways. All of these had been built and had been in operation for many years prior to 1954 when the Triborough Bridge and Tunnel Authority and the Port of New York Authority conducted an intensive and comprehensive study of arterial facilities to determine our traffic requirements and to lay out a program to meet the unprecedented post World War II and Korean conflict boom in vehicular ownership, expanding economy, population growth and suburban development.

The enormity of the problem can best be illustrated by citing a few figures. In 1954, 38 million motor vehicles crossed the Triborough Bridge while in 1958 some 46 million vehicles used this facility. For the same periods 26 million used the Whitestone Bridge while four years later 30 million crossed it. Traffic in the Queens-Midtown Tunnel jumped from 14 million annually in 1954 to more than 21 million in 1958. While the increase in the use of the Hudson River crossings was not as sharp it still reached into the millions in those four years.

The joint study emphasized the importance of providing additional adequate arterial connections among the growing suburban residential, business and industrial communities of Connecticut, Westchester, Northern New



Proposed Narrows Bridge Rendering—looking towards Staten Island.

Jersey and Long Island with New York City. It also emphasized the need of additional water crossing facilities and the necessary approaches and arterial connections to enable the surge of traffic to pass through and around the congested streets of the city. We are in the midst of carrying out this program.

It involves more than 30 projects, each of which is a major undertaking, and all of which fit into a carefully designed pattern now being woven by architects, engineers and construction organizations. The projects range from the enormous Narrows Bridge, crossing the sea lane in New York's lower bay, on the longest suspension span ever built; the lower deck of the George Washington Bridge; the Throgs Neck Bridge from the Bronx to Queens; to expressways across Manhattan, the Bronx, Brooklyn, Queens, Westchester and Long Island.

This pattern will mean quicker and more efficient movement of through traffic, and the diversion to express routes of millions of motor vehicles annually from the overtaxed and entirely inadequate streets and avenues of New York City.

The problem of traffic in only one segment of New York City can be best visualized by these figures developed in a recent survey by a New York City newspaper: below 60th Street in Manhattan there are 600,000 residents; 2,000,000 persons pour in daily to work; and another 1,300,000 to shop, see the sights or pass through!

The major projects in our $2-billion metropolitan arterial program are:

Narrows Bridge

This is a $320-million span crossing the Narrows from Brooklyn to Staten Island. A 12-lane, double-deck suspension bridge, it will accommodate 15 million vehicles during its first year of operation in 1965, taking an estimated 3.5 million vehicles annually from the Holland Tunnel and lower Manhattan Streets. It will provide a direct route, by-passing Manhattan, for millions of vehicles, and it will make Staten Island, the last large undeveloped area in New York City, an easily accessible residential area. At present the only link between Staten Island and Brooklyn and Manhattan is by ferry. Staten Island's present population of 210,000 is expected to triple in 16 years.

Incidentally this will be the longest suspension bridge in the world. Its center span of 4,260 feet will be 60 feet longer than the center span of the Golden Gate Bridge in San Francisco. The Port of New York Authority and the Triborough Bridge and Tunnel Authority will start construction on the Narrows Bridge this summer.

The principal Staten Island connecting highway will be the seven-mile long Clove Lakes Expressway from the Goethals Bridge to the Narrows Bridge. A four-lane section of the Willowbrook Parkway from the Clove Lakes Expressway to the Bayonne Bridge approaches will be included in the Clove Lakes Expressway construction with a total cost of $33.6-million. The eight-mile long West Shore Expressway will connect the approaches of the Goethals Bridge and the Outerbridge Crossing. The Richmond Parkway, 9.5 miles long, will extend from Outerbridge Crossing to the Clove Lakes Expressway near the Narrows Bridge.

On the Brooklyn side, the bridge will connect with the existing Shore Parkway, which skirts the southern end of Brooklyn. The main approach will cost $90-million and will include a new expressway along Seventh Avenue in Brooklyn, connecting with a reconstructed Gowanus Expressway. This will provide direct connections with the Brooklyn-Battery Tunnel and the Brooklyn-Queens Expressway leading to the Triborough and Bronx-Whitestone and new Throgs Neck Bridges.

Throgs Neck Bridge

The Triborough Bridge and Tunnel Authority broke ground in October 1957 for the six-lane, single-deck Throgs Neck Suspension Bridge from the Bronx to Queens. This $90-million structure is scheduled for completion in January 1961. With the Triborough and Bronx-Whitestone Bridges at near capacity this new crossing is essential.

In Queens the Throgs Neck Bridge will connect with the five-mile Clearview Expressway which will be linked with the Long Island Expressway. The $40-million section between the bridge and the Long Island Expressway is expected to be completed by the time this bridge is opened to traffic, with an extension south to Hillside Avenue scheduled for completion in 1966.

The Bronx end of the Throgs Neck Bridge will include two extensive approach projects. The Throgs Neck Expressway will extend 1.5 miles from the bridge to the equally new six-lane Bruckner Expressway, which leads directly to the southern terminus of the New England Thruway. Motorists crossing Throgs Neck Bridge from Queens or Long Island will have a fast, direct route across the Bronx on the Cross-Bronx Expressway, which was started in 1958 and is scheduled for completion late in 1960, or to New England via Bruckner Expressway.

George Washington Bridge

The Cross-Bronx Expressway will lead into a new eight-lane $10-million Alexander Hamilton Bridge across the Harlem River, then to the new depressed Trans-Manhattan Expressway across 178-179th Streets which connects with the double-deck George Washington Bridge.

Thanks to the foresight of the engineers who designed the George Washington Bridge in the 1920's, provisions for a lower level were made, permitting this additional six-lane roadway which will yield a 75 per cent increase in the bridge's capacity. Plans include an interstate bus facility at the New York side of the bridge, a twelve-lane expressway across Manhattan, and connections to all existing and proposed major arterial routes in both states. The total estimated cost of this project is $183-million. It is expected to be opened for traffic in mid-1962. Nearly $30-million in work on the New York and New Jersey approaches is now under contract. A new Bergen-Passaic Expressway in New Jersey will provide a ten-lane approach system to the new double-deck structure.

Lower Manhattan Expressway

As pointed out earlier, one of our chief problems is to alleviate the incredible traffic congestion existing in mid and lower Manhattan. After many years of costly delay, we expect this year to start acquisition of rights of way for a ten-lane elevated Lower Manhattan Expressway which will have direct connections with the Holland Tunnel on the west side and the Williamsburg and Manhattan Bridges on the east side. The estimated cost is $83-million.

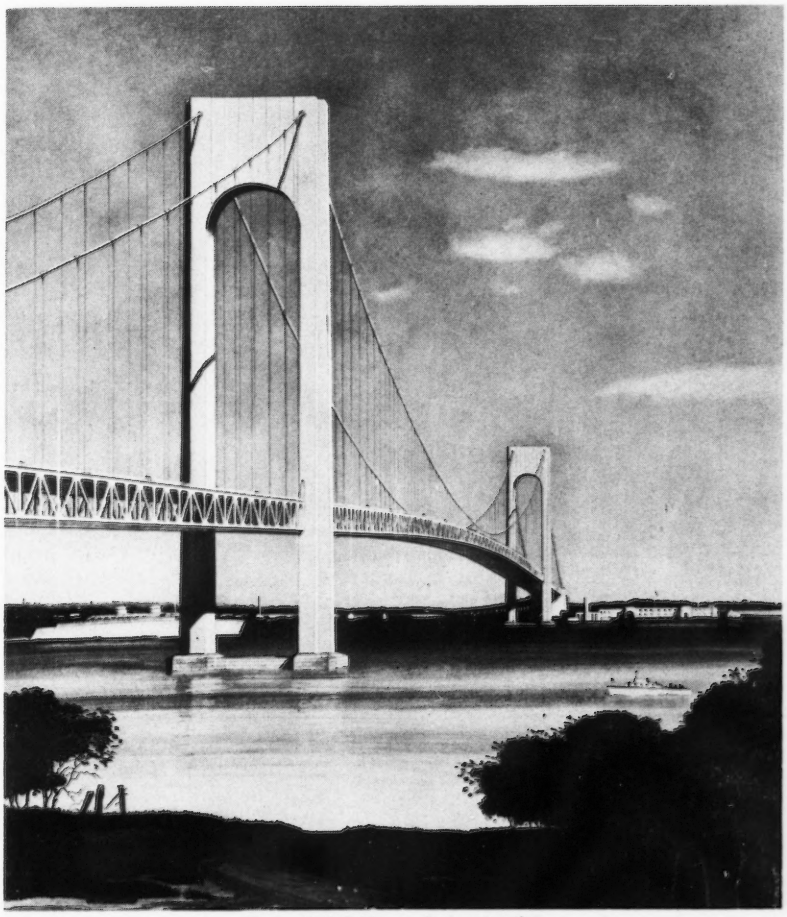
Mid Manhattan Expressway

Of equal importance are our plans for a six-lane elevated Mid Manhattan Expressway paralleling 30th Street in Manhattan. This $97.9-million structure will connect with the Lincoln Tunnel on the west side and the Queens-Midtown Tunnel on the east side. Route plans have been submitted to the governing body of the city for public hearing and approval.

In addition to the major projects outlined here, we are in various stages of progress on other major arterials, too numerous to detail but nonetheless vital in the completed picture. For example, for many years we have, step by step, been constructing a Long Island Expressway which eventually will extend 85 miles from the Queens-Midtown Tunnel to Riverhead in Suffolk County. We are nearing completion of a Brooklyn-Queens Expressway which extends 8.8 miles from the Brooklyn-Battery Tunnel to the Grand Central Parkway.

(Continued on page 42)

Narrows Bridge Rendering.



Throgs Neck Bridge, under construction.

A Case For Overhead Signing

By John R. Crosby
(Assoc. Mem., ITE)
Traffic Engineer
New Jersey Turnpike Authority

THE GEORGE WASHINGTON BRIDGE Interchange is the northern terminal interchange of the New Jersey Turnpike system. At this location a full interchange exists between the Turnpike and U. S. Route 46 lying approximately four miles west of the Hudson River crossing bearing the same name. The choice of the interchange name in this case was not a chance one but quite intentional as over one-half of the 11 million vehicles passing through the interchange traversed or are destined to use the Bridge.

The barrier toll plaza within the interchange area handles one of every four vehicles traveling the 131-mile Turnpike system. Its traffic problems are compounded by an equally heavy mixed movement of transient and commuter traffic. This combination combined with the geometrics of the exit ramps had resulted in a difficult signing problem.

Prior to the expansion and reconstruction of the interchange during 1958, the off-bound plaza consisted of eight toll lanes having a width of 120 feet. From this area, the plaza gradually narrowed down to a width of 30 feet at a point approximately 600 feet north of the toll booths. The gore of the interchange ramps was 150 feet farther north from this minimum width area. Figure 1 illustrates the basic layout of the interchange. Points identified as "A" and "B" indicate the location of the original signing adjacent to the exit ramps.

With the growth of traffic over the years, the inadequacy of the original signing became more apparent. These ground mounted signs frequently were hidden from view to other vehicle operators by trucks, buses and other large vehicle combinations on the road ahead. The illumination throughout the area with 20,000 lumen mercury vapor luminaires on thirty foot standards also tended to reduce the effectiveness of the ground mounted reflectorized signs. Neither of these problems are believed to be unique as many traffic engineers are undoubtedly familiar with similar problems that exist at almost any direct connection type interchange carrying heavy traffic volumes at moderate or high operating speeds.

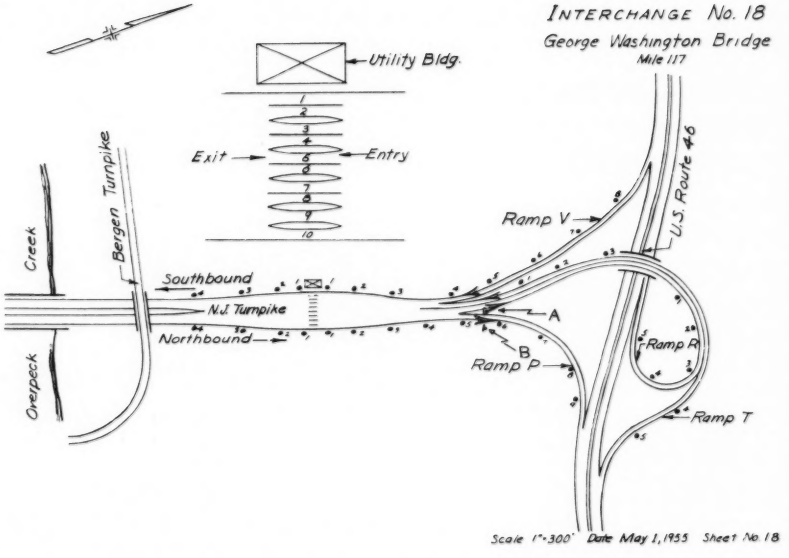


Figure 1
Schematic layout of original interchange prior to addition of toll lanes and sign structure.

The lack of exit plaza capacity during peak periods in 1957 caused the New Jersey Turnpike Authority to advertise for bids during the Spring of 1958 for the reconstruction of the plaza. Based upon traffic counts taken during periods of peak hourly demands in 1957, it was determined that an addition of three toll lanes, bringing the total to 13 lanes, would be required to adequately serve traffic demands through the early years of the 1960's. During the critical peaks of predominately exit movements, the capacity of the new interchange would be 1500 entries and in excess of 3000 exit movements per hour. Even higher calculated capacity figures result when movements are predominately on-bound as an entry toll lane has over twice the capacity of an exit lane with our toll system.

The plaza widening resulted in a maximum exit plaza width of 180 feet

Figure 2
A view of the signs and bridge structure from the toll booth area. Note ground mounted sign partially blocked by truck on right.

at the toll booths, funneling down to a minimum width of 96 feet some 700 feet north of the toll booths. This extreme width of pavement ruled out the use of ground mounted signs at the new interchange.

The new basic overhead sign layout was developed by the Traffic Engineering Department of the Authority in conformance to the current sign design standards. The selection of the fabrication material was also made by the Traffic Department with the assistance of the Maintenance Department, as it was realized that maintenance of these signs could be difficult as well as expensive if improper materials were used.

A Pfaff and Kendall 110 foot long, 4'-6" square cross-section, aluminum truss structure was selected to support the two destinational signs. The signs were fabricated of porcelain on aluminum with white message copy and dark green background color. Both signs (Figure 2) are 5'-8" high and widths are 17'-6" and 21 feet respectively. The porcelainized sign panels are supported on an aluminum frame constructed of 3" x 3" x ⅜" aluminum angles. Miscellaneous hardware, including mounting U-bolts, is of stainless steel. Currently, illumination is provided by a single continuous row of fluorescent tubes supported on 5 foot arms extending out from the lower stringer of the bridge truss. The top of the fixtures is 15 inches below the bottom of sign to provide an unobstructed view of the sign without interference within normal viewing limits. The present single tube fixtures are to be replaced at an early date with double tube units. A substitution of the units will increase the reliability of the installation removing the lamp maintenance problem from the critical list.

The sign bridge installation is built for a design wind loading of 100 miles per hour. The sign truss which provides 17 foot roadway clearance is supported by four 10 inch O.D. tapered shafts. The stringers have an O.D. of 5½ inches with 2 inch diagonal bracing. As may be viewed in the several photographs, the installation is a very neat one requiring a minimum of maintenance which is the final test of a good sign installation.

Installation Review

Progress and improvements in signing techniques and materials frequently result from an objective review of existing installations. Although the described installation has been in existence since the early Spring of 1959, the Department has appreciated several improvements which will be recommended for incorporation into the design of any future installation of a similar type, and are as follows:

1. The fused message copy displayed on these signs is a permanent part of the sign face. The dynamic character of our current highway building program points up the desirability for signing flexibility which is not economically possible with this installation. Any need for a change in message copy on either sign requires that the present panels be scrapped and new ones fabricated. The use of removable type message copy would lend itself well to this desirable feature.

2. Electric power distribution is highly dependable in this day and age but even so from time to time service is interrupted. As highway signing is a necessary part of safe and efficient

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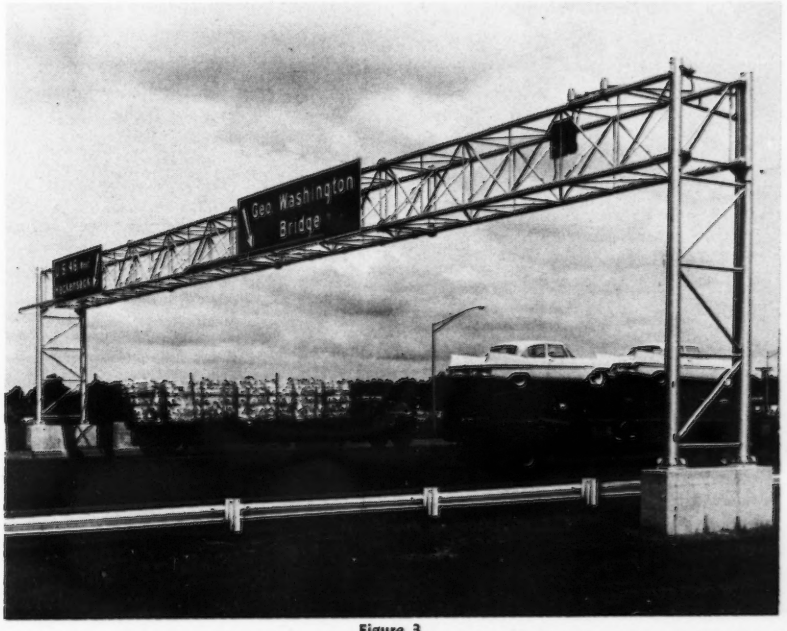

Figure 3
Side detail of structure and right side column support. Note guardrail protection around support and photoelectric controller and electrical distribution above roadway shoulder area for ease of maintenance.

The Speed Factor in Highway Accidents

By C. W. Prisk
(Mem., ITE)
Director, Highway Safety Study
U. S. Bureau of Public Roads

BECAUSE A BETTER UNDERSTANDING is needed of the role of driving speed in traffic accidents, a new research approach has been designed by the Bureau of Public Roads to provide factual knowledge of the relation between speed and accidents. The method has been thoroughly tested, using 600 miles of highways in 11 States as a setting, and drawing on 10,000 accident records and on observations and interviews with 290,000 drivers using these highways. In the course of the study, a variety of other driver and vehicle characteristics have also been related to accident involvement.

The problem has always been on the question of the frequency of accident involvement for vehicles traveling at various speeds. Accident reports often show the estimated travel speeds of vehicles involved in highway accidents, but it is of little value to know that drivers involved in accidents were traveling at certain speeds. If the risk is to be taken into account, it is essential to determine how much driving is done at various speeds. Then, by relating the travel speeds of accident-involved drivers and those of all drivers, the hazard associated with various driving speeds can be determined. The discussion that follows describes the nature of the speed-accident research that has been performed in cooperation with the States, the results of which have been reported in the Section 117 Highway Safety Study recently submitted to the Congress.

Site of Speed-Accident Research

The studies were conducted on 600 miles of primary rural highways, comprising 35 different sections in 11 States. Speed zones and other controlling conditions having a major effect on speed were avoided in choosing the study sections. The average speeds along each section were first determined by having a driver-observer-recorder team drive a test car over the highway, moving with the normal flow of traffic and recording speed at periodic intervals. A substantial number of runs were made and averaged, and a speed profile was drawn showing the average speed in each direction at intervals along the selected highway section. These were studied by State highway department engineers, who selected a site in each section representative of the average speed for the entire section. Care was taken in selecting the specific sites for measuring speeds to insure that representative speed distributions would be obtained.

Speed Measurements

At these study sites, speed measurements of individual drivers were made during representative day and night hours; on weekdays, Saturdays, and Sundays, and during the several seasons of the year. Thus the data obtained could be considered as typical of all traffic using the highway throughout the year. The speeds of 290,000 drivers, representative of everyday traffic at typical locations on primary rural highways, were thus obtained.

Well beyond and far out of sight of the speed-observation points, the same drivers were stopped and interviewed in order to obtain information on other driver and vehicle characteristics. Thus a representative sample was obtained of the speed and detailed composition of the traffic on each of the 35 study sections. With traffic volume also accounted for, these data constituted the exposure base for determination of accident rates.

Accident Data

Source of the accident data for the analysis was the reports for 10,000 drivers and their vehicles that had been involved in accidents on the 600 miles of highways studied. Used were the records of all reported accidents that had occurred on the study sections during a period of either 3 or 4 years (ending June 30, 1958).

Most of the 11 States had better-than-average reporting and their reports provided adequate data on most characteristics studied, such as age and sex of driver, and model year of automobile driven. Driving speeds were those reported by the police investigators or, in accidents not investigated, those reported by the driver or drivers involved. It should be noted that normal travel speed of accident-involved drivers was used; that is, the speed at which the driver was estimated to be traveling prior to the occurrence of the accident. This is not the speed at the moment of impact, but the normal speed of the driver before he was aware of an impending accident.

Comparison of Speed Distribution

From the speed information on the accident reports and from the speed measurements on the highway, the numbers of accident-involved drivers and interviewed drivers who were traveling at various speeds were tabulated. ("Accident-involved drivers" are those for whom speed data were obtained from the accident reports; "in-

terviewed drivers" are those who were observed and interviewed on the test sections, and consequently represent in effect all drivers.) Converted to a percentage basis, the data are plotted in figure 1, with the percentage scale at the left. The two curves indicate the percentages of drivers in each group that traveled at various speeds.

If the speed distributions had been the same, the curves obviously would have been identical also, which would indicate that the chance of being involved in an accident would be the same at all speeds. However, the curves are quite different. For example, more than 25 per cent of the interviewed drivers traveled at about 50 miles per hour, but only 17 per cent of the accident-involved drivers were going at that speed prior to the accident. Study of the relation of the two curves clearly indicates that a larger proportion of accident-involved drivers were traveling at low speeds than was the case with interviewed drivers. Conversely, a larger proportion of interviewed drivers than accident-involved drivers traveled at the higher speeds. For example, 13 per cent of the interviewed drivers traveled at 60 miles per hour, as compared with 7 per cent of the accident-involved drivers.

Thus there is an unmistakable indication that on main rural highways built to modern standards, low-speed drivers are more likely to be involved in accidents than high-speed drivers, within the limits of the study. At extremely high speed, approaching 80 miles an hour, the difference disappears.

The Travel Factor

A study of accident involvement by percentages of drivers operating at various speeds does not take the mileage of travel into account. The number of drivers involved in accidents at any selected speed has to be related to the amount of travel at that speed. First, the total vehicle-miles of travel was determined on each section for the 3- or 4-year period covered by the accident records. Traffic volume counts obtained at periodic intervals from automatic counters placed along the highway were used in this calculation. The number of vehicles counted during the period, multiplied by the length of the section in miles, provided figures for the total vehicle-miles of travel.

These total travel mileages were distributed among the various speed groups, using the speed measurements taken on the highway. If 10 per cent of the drivers, for example, were traveling at 40 miles per hour, then 10 per cent of the vehicle-miles of travel was assigned to that speed. Consideration was given to hourly, daily, and seasonal variations so that the distribution would properly represent the period for which accident records were available.

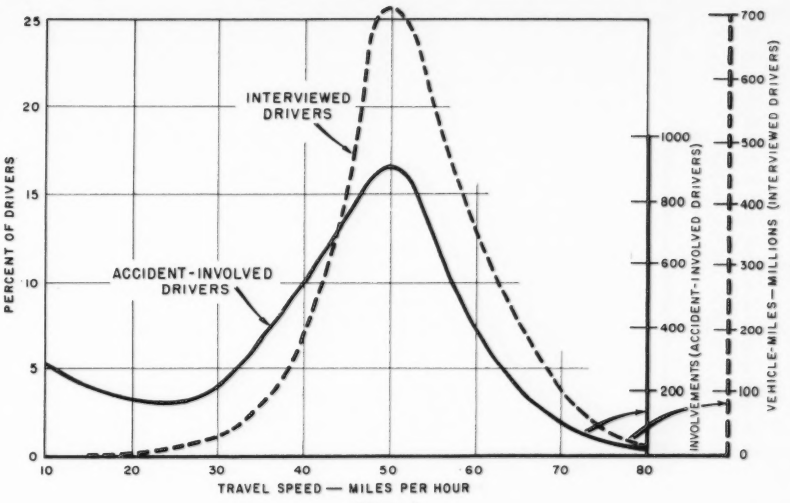

Figure 1
Travel speeds of accident-involved and interviewed drivers—daytime.

The two scales at the right of Figure 1 present the accident and travel information. The solid-line curve indicates the number of accident-involved drivers and the dash-line curve, the vehicle-miles of travel for interviewed drivers. Using these scales the curves show, for example, that at 50 miles per hour 911 drivers were involved in accidents during a period when 715 million vehicle-miles were traveled on the road.

Accident Involvement Rate

From such figures for each speed range the accident-involvement rate is calculated, by dividing the number of accident-involved drivers by the vehicle-miles of travel. For the 50-mile per hour example just cited, the rate would be 911 divided by 7.15 (using the commonly accepted travel exposure unit of 100 million vehicle-miles), or 127. The accident-involvement rate so

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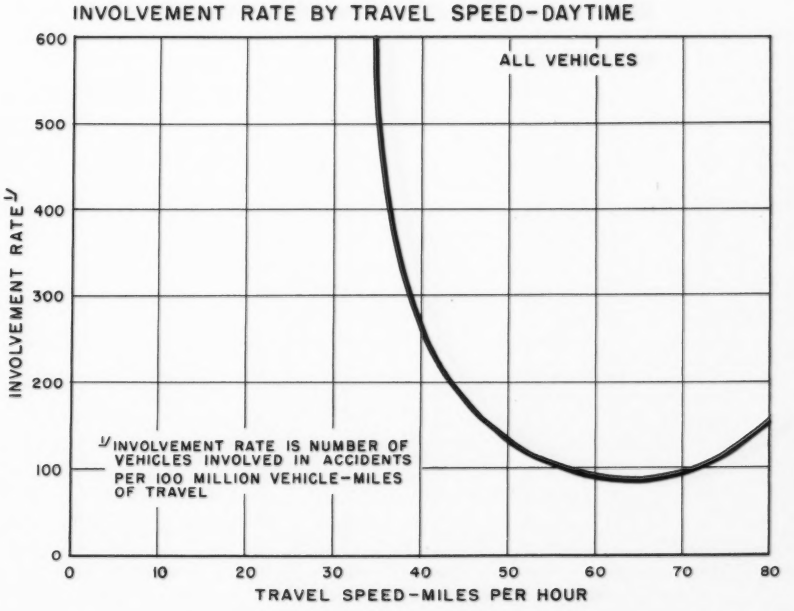
INVOLVEMENT RATE BY TRAVEL SPEED-DAYTIME
ALL VEHICLES
INVOLVEMENT RATE 1/
1/ INVOLVEMENT RATE IS NUMBER OF VEHICLES INVOLVED IN ACCIDENTS PER 100 MILLION VEHICLE-MILES OF TRAVEL
TRAVEL SPEED-MILES PER HOUR

A Traffic Frequency Recorder Can Find the 30th Hour

By Charles E. Zell
(Assoc. Mem., ITE)
Associate Highway Engineer
California Division of Highways

WHENEVER TRAFFIC ENGINEERS get together, almost invariably the question is asked, "How do you determine the 30th hour." The answers vary from a "guesstimate" to a long dissertation.

Counting traffic during various peak periods to determine the peak hour appears to be one of the most frequently used methods. The peak hour, or a slight modification of it, is then called the 30th hour. Sometimes it is related to the average daily traffic to determine if it appears reasonable. This method is easy and it does not take a year to collect the data, but the engineer still does not know if he has the elusive 30th or the 10th or the 50th hour.

Another method used is to classify each road as to its predominant type of traffic, i.e., recreation, commuter, rural interstate, etc. From past experience, practice, and/or special studies, the 30th hour is assumed to be some percentage of the ADT, such as, 20%, 10% and 12% for recreation, commute, and rural interstate routes, respectively. This method is only as good as the assumptions which sometimes leave much to be desired.

In a number of places permanent traffic counters are maintained. The volume is recorded each hour, generally on a paper tape. This is as accurate as the counting equipment, but requires considerable manual work or the use of punch cards and machine processing for summarizing and analyzing the data because more data are collected than are needed. In any case, the cost is generally higher than desired.

The Danish Highway Authority is using a traffic frequency recorder (Figure I) developed by Mr. A. O. Malvig, Assistant Chief Engineer, Ministry of Public Works and the Telefon Fabrik Automatic, A/S. The traffic frequency recorder overcomes many of the equipment and method problems encountered in determining the 30th hour.

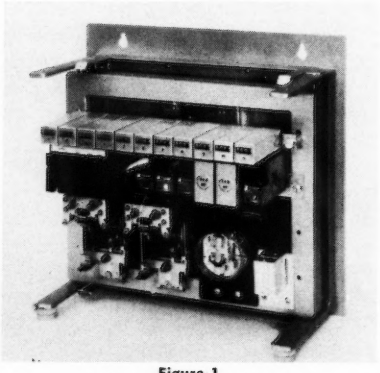

Figure 1
Traffic Frequency Recorder

The traffic frequency recorder records the number of hours ten different hourly volumes were exceeded. An additional counter records the total number of hours traffic was counted. The readings from the counters are plotted on semi-log paper using the logarithmic scale for the number of hours and the linear scale for the hourly volume. The resulting ogive curve can be interpreted and the 20th, 30th, 50th, or any other hour can be read from the curve. The data can also be used to compute the ADT. Figure II shows the ogive curves plotted from the data in Tables I and II.

In principle, the cumulative frequency distribution is determined by counting the number of hours (out of the 8,760 hours per year) during which the hourly traffic has exceeded a given volume, e.g.

Counter	Hourly Volume Exceeding
1	50
2	100
3	200
4	300
5	400
6	600
7	800
8	1,100
9	1,200
10	1,300

The above hourly classifications are shown as an example; they can be varied, but each value must be a multiple of 50, and the largest can not exceed 2,500. The recorder is equipped with a multiprong plug which permits the changing of the counter classifications in less than a minute and without the use of tools.

Once an hour, a clock transmits an impulse to a counter (#11) which records the number of hours since the recorder started and at the same time the selectors are returned to the zero position. The selectors then receive the impulses from a traffic counter or vehicle detector. When the 50th vehicle has been recorded by the selectors, counter No. 1 advances by one digit, but is then precluded from advancing again during the hour concerned. If and when the 100th vehicle has been recorded by the selectors during the hour, counter No. 2 advances by one digit, but is then precluded from advancing again during that particular hour, and so forth. It is only after the lapse of the full hour that the counters Nos. 1, 2, etc., are restored to action when the selectors are returned to zero. After a period of, say, one year, the counters furnish a complete series of

readings, indicating the number of hours of the year during which the traffic has exceeded the specified hourly volumes. It is these counter readings which are plotted as the ordinate on Figure II and their classification is the abscissa.

The selection of the classifications for the counters requires some knowledge of the traffic characteristics of the road where the recorder is to be placed. The approximate average daily traffic, 30th hour, and maximum hourly volume should be known or estimated. It is realized that these values may be strictly guesses the first year, but as more data are accumulated, the classifications can be adjusted to yield better data. It should be noted that the 10th counter should be set at or just above the maximum hourly volume as the median hourly volume (used in computing the ADT) for the hours recorded on the 10th counter will have to be estimated; also, if more than 30 hours are recorded on this counter, the 30th hour can not be identified.

The plotting of the counter readings, determining the 30th hour, and computing the average daily traffic can be accomplished in a matter of only a few minutes. The maintenance of the recorder at a permanent location for a number of years will yield trend data for both the ADT and 30th hour. This trend data is particularly useful in making future traffic projections where the future ADT may be used to compute economic benefits and the future 30th hour to determine future capacity requirements. The trend of the relationship between 30th hour and ADT will be of particular interest to traffic researchers and planners.

The data from two permanent count stations were used to check the accuracy of the methods used with the recorder to calculate the ADT and estimate hourly volumes. The character of the traffic at the two permanent count stations are significantly different. One station is on a heavily traveled rural recreational route. The comparisons of the computed and estimated values with the actual values are shown in Table III. The comparisons indicate that there is no significant difference between the values from the recorder and from a permanent counter.

The traffic frequency recorders used by the Danish Highway Authority are manufactured with components which have proven their service reliability in telephony for many years. The counters

TABLE I

TRAFFIC FREQUENCY RECORDER COMPUTATIONS

Rural Through Route Date: 0000 hr 1-1-58 to 24000 hr 12-31-58

Counter	Hourly Volume Exceeding	Hours Recorded	Hours in Volume Range	Median Hourly Volume for Volume Range (1)	Total Vehicles in Volume Range (2)
11	0	8,760	108	50	5,400
1	100	8,652	3,023	240	725,520
2	400	5,629	1,548	495	766,260
3	600	4,081	2,208	680	1,501,440
4	800	1,873	1,333	870	1,159,710
5	1,000	540	273	1,040	283,920
6	1,100	267	144	1,140	164,160
7	1,200	123	82	1,250	102,500
8	1,300	41	23	1,340	30,820
9	1,400	18	18	1,450	26,100
10	1,600	0	0		

Total Annual Traffic	4,765,830
Average Daily Traffic	13,057
30th Hour (1)	1,340
30th Hour % of ADT	10.3

(1) From Figure II

(2) Product of hours in volume range and median hourly volume

TABLE II

TRAFFIC FREQUENCY RECORDER COMPUTATIONS

Rural Recreational Route Date: 0000 hr 1-1-58 to 2400 hr 12-31-58

Counter	Hourly Volume Exceeding	Hours Recorded	Hours in Volume Range	Median Hourly Volume for Volume Range (1)	Total Vehicles in Volume Range (2)
11	0	8,760	6,964	15	104,460
1	50	1,796	1,383	65	89,895
2	100	413	310	115	35,650
3	150	103	81	165	13,365
4	200	22	14	220	3,080
5	250	8	5	270	1,350
6	300	3	2	320	640
7	350	1	0	—	0
8	400	1	1	410(3)	410
9	450	0	0		
10	500	0	0		

Total Annual Traffic	248,850
Average Daily Traffic	682
30th Hour (1)	190
30th Hour % of ADT	27.9

(1) From Figure II

(2) Product of hours in volume range and median hourly volume

(3) Estimated value

used are of the standard type employed by the British Post Office for use in telephone circuits. Endurance tests have shown that these counters can register 14 million impulses without miscount or visible wear, and without requiring any attendance. The recorder operates on 24 volts DC with a maximum current demand of 2.5 amps. It is 15-1/8" x 15-1/8" x 8-1/2" and weighs approximately 40 pounds.

In Denmark the recorder is used with a "DEA" traffic counter (Figure III) which is used to detect the vehicles and transmit an impulse to the recorder. This counter is of a type first developed in Denmark in 1930 and has been continuously improved. The counter uses a very simple and inexpensive magnetic detector with a transistor amplifier. The amplifier, relays, and counter are contained in a waterproof steel box which has room for dry or wet cells or transformer and rectifier. The "DEA" counter also operates on 24 volts DC.

The detector for this counter consists of a single loop of number 10 wire which may be placed on the pavement or in a groove 1/4" x 1/2". The sides of the loop are approximately 10 inches apart. The loop can be placed across a two- or three-lane road or separate loops can be used for each lane for any number of lanes. At permanent locations, the installation cost is very small and there is no maintenance for the detector. At temporary locations the wire loop can be fastened to the pavement like a rubber tube. The cost of the wire loop is small and the only maintenance problem at temporary locations is the wear of the insulation on the wire. This is not a problem on dry pavements.

The traffic frequency recorder and the "DEA" traffic counter appears to be just what traffic engineers have been looking for — simple, accurate, and trouble-free equipment which records traffic data in a manner which permits ease and speed in computing average daily traffic and 30th hour.

The "DEA" traffic counter is also known as the Malvig System. It it manufactured by Jorgen A. Pedersen, Copenhagen, Denmark, and the Streeter-Amet Company is the sole agent in the western hemisphere.

The traffic frequency recorder is manufactured by Telefon Fabrik Automatic A/S, Copenhagen, Denmark.

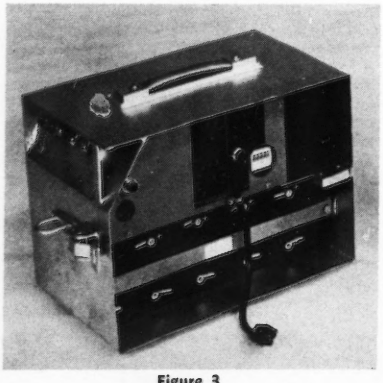

Figure 3
"DEA" Counter

Figure II

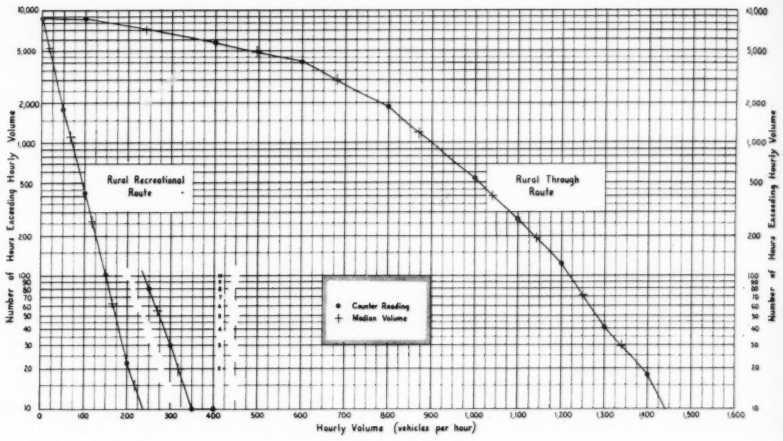

Figure 2
Graph of Hours vs. Hourly Volume

TABLE III
COMPARISON OF COMPUTED AND ESTIMATED VALUES TO ACTUAL VALUES

Rural Through Route	Computed or Estimated	Actual	Difference
Total Traffic	4,765,830	4,826,348	59,078
ADT	13,057	13,223	1.3%
30th Hour	1,340*	1,358	18
30th Hour % of ADT	10.3	10.3	0.0
20th Hour	1,385*	1,390	15
40th Hour	1,305*	1,317	12
50th Hour	1,282*	1,285	3
60th Hour	1,265*	1,275	10
Rural Recreational Route			
Total Traffic	248,850	254,988	6,138
ADT	682	699	2.4%
30th Hour	190*	191	1
30th Hour % of ADT	27.9	27.3	0.6
20th Hour	205*	206	1
40th Hour	180*	182	2
50th Hour	173*	172	1
60th Hour	168*	165	3

*Estimated values taken from Figure II

Mark this date on your calendar!

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29th ANNUAL MEETING
Institute of Traffic Engineers

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SEPTEMBER 14 - 17, 1959
Hotel Commodore
New York City

Traffic News

Nominations for Safety Council's Awards

A deadline of September 1, 1959 has been set by the National Safety Council for nomination of candidates for its Awards for Traffic Safety Activities for 1958. These awards are given to individuals and organizations who have contributed significantly to traffic safety during the year.

Any individual, organization, association, or governmental unit may be nominated for a Citation Award, except those in fields covered by other National Safety Council award programs and those having a direct responsibility in traffic safety.

Nominations will be reviewed and citation winners selected by a board of judges composed of nationally recognized traffic safety leaders. Winners will be announced at the meeting of the Traffic Conference held during the National Safety Congress, October, 1959.

Alfred J. Hendron, Clifton, Ill., winner of fifth C. C. Wiley Traveling Award in Highway Engineering at the University of Illinois, shows his 2-foot stack of "homework" to Prof. Wiley. Hendron will start June 22 on an eight-week, 6,900 mile trip through seven North Central and Eastern States and Canada visiting highway projects and activities and 44 people. The stack contains technical reports, papers, and other material he must read before going. During the trip he will make several hundred color slides and other material for a detailed report to be used by the University's civil engineering classes. The $1,200 award is given by a U. of I. civil engineering alumnus to honor Prof. Wiley who retired in 1952 after 46 years on the university staff as a pioneer in highway engineering.

Douglas C. Mackenzie, Peter K. Rask Honored

A retirement party honoring Mr. Douglas C. Mackenzie, City Engineer and former Traffic Engineer of the City of Pasadena, and Peter K. Rask (Mem. ITE), present Traffic Engineer of the City of Pasadena, both of whom retired the 31st of June, was given by the J. E. Bauer Company on May 26th. This Company has been supplier of traffic paint to the City of Pasadena for a number of years.

Mr. Mackenzie started work with the City in June of 1922 upon his graduation from the California Institute of Technology and has worked continuously for the city except for a leave in 1926 to take a post graduate course at Bucknell University, military service from 1941 to 1946, and one and one half years as City Engineer of Laguna Beach, California, in 1946-47. Mr. Rask came to Pasadena in 1926 from Hartford, Connecticut where he attended Trinity College and worked for the City of Hartford in the Engineering Department, and has been with the City of Pasadena since that time.

Those attending this most successful evening were: R. E. Pontow, City Engineer of West Covina; John Gault, Engineering Department, Pasadena; George Parmelee, Automobile Club of Southern California; Ed Granzow, Traffic Engineer, Pasadena Police Department; William Martini, City Engineer of Glendale; Charles Lortz, City Engineer of Arcadia; Robert Colpitts, Traffic Engineer of Alhambra; and Al Hutchison, Assistant Traffic Engineer, Los Angeles. Also, Don Robbins, City Engineer of Compton; Clayton Paige, City Engineer of Burbank; Guy McDonald, Traffic Engineer of Los Angeles County; Sam Taylor, Traffic Manager of Los Angeles; Peter Rask, Traffic Engineer of Pasadena; Jack Bauer, owner of J. E. Bauer Paint Co.; Roy Meggison, Sales Manager, J. E. Bauer Paint Co.; Douglas Mackenzie, City of Pasadena; Vernon Smith, Road Commissioner of Kern County; James Mulrooney, Los Angeles County Road Department; Harry Keebaugh, City Engineer of San Gabriel; Robert James, City Engineer of San Fernando. Also, Fritz Zapt, City Engineer elect of Pasadena; George Bullock, Traffic Engineer of Burbank; William Canessa, Assistant Road Commissioner of Kern County; Richard Barhite, Director of Public Works, City of Downey; Phillip Slavin, Traffic Engineer, Los Angeles County Road Department; Roy Smith, California Division of Highways; H. P. Reading, Research Engineer of J. E. Bauer Paint Co.; and Jack Eckhardt, California Division of Highways.

The party was held at the Jonathan Club in the City of Los Angeles. The J. E. Bauer Paint Company is a Sustaining Member of the Institute of Traffic Engineers.

Waco, Texas Added to ITE Award List

Waco, Texas has been added to the list of cities honored by the Institute of Traffic Engineers for traffic engineering performance in 1958. This makes a total of 80 cities and counties

so recognized, together with 12 states.

The omission of the name on the original list published recently was the result of an oversight in compilation of the original list of eligible cities furnished to the Institute. The award certificate is being prepared now and will be presented soon.

Tandem Trailers Approved by N. Y. State Thruway Authority

The New York State Thruway Authority has approved the use of tandem-trailers on the 559-mile superhighway system, effective immediately.

The tandem vehicles comprise a heavy duty truck tractor hitched to two regular size trailer units, with the trailers connected by a "dolly" unit. The overall length of the combination unit may not exceed 98 feet and its gross weight may not exceed 127,400 pounds.

Colonel Clinton B. F. Brill, Thruway Authority Chairman, advises the decision to make the tandem operation permanent was based on a careful survey of tandem units on the Thruway during the past four ond one-half months. Six major trucking firms have been operating the tandems on the superhighway since February 4 under Special Hauling Permits issued by the Authority.

Colonel Brill points out that the tandems traveled approximately 350,000 miles during the trial period under intensive observation by Authority personnel, State Police, the Authority's economic consultants, Madigan-Hyland of New York City, and various traffic experts. All of these, including the State Police, recommended to the Authority that tandems be permitted to operate on the Thruway.

The approval of tandem operations was motivated by the Authority's obligation to promote more economical movement of motor freight over the superhighway with an eye to probable transportation savings to consumers and the development of new procedures that would enhance the industrial and commercial development of New York State.

The Massachusetts Turnpike Authority, which also has participated in the tandem test runs, is expected to adopt similar rules and regulations to permit tandem operations. With such concurrence, tandem vehicles will be able to travel via superhighway between Boston and the Pennsylvania border near Ripley, a distance of 509 miles. Tandem units are not permitted on other State highways.

In approving permanent operations of the tandems, the Authority fixed stringent regulations to govern the use of such units on the Thruway. All of the tandem equipment will be permitted to operate only under Tandem Trailer Permits issued by the Authority, all of the equipment must be registered with the Authority by the operators and approved by the Authority, and all tandem drivers must be licensed by the Authority after a careful investigation of their driving records and qualifications.

The operators and manufacturers of the equipment must certify to the Authority that their vehicles can maintain a minimum speed of 20 miles per hour along the Thruway's main line, and must guarantee that adequate braking and other safety equipment are being used.

The State Police will enforce strictly the 50 mile-an-hour speed limit for commercial vehicles, and will continue to maintain a close surveillance on all tandem units. All tandems must keep 500 feet from other vehicles, except when passing.

Each driver must check his vehicle thoroughly before each trip on the Thruway and complete a special check list of the inspection. The check list must be turned in to a Thruway Toll Collector when the unit enters the Thruway System.

Only those trucking companies that maintain charge accounts with the Authority will be permitted to operate tandem units on the Thruway.

The Authority notified the trucking operators that the Tandem-Trailer Permits might be revoked by the Authority at any time because of inclement weather or poor traveling conditions. However, the Authority noted that the tandems had been operating during the past Winter months and during severe snow and ice storms with less operating difficulties than regular commercial units.

All tandems will be charged double the regular tolls on the Thruway, which in most cases will be 10 cents per mile.

Major truck operators were notified of the Thruway's approval of tandem operations during a special commercial conference sponsored by the Authority. The meeting was one of a series staged throughout the northeastern United States by the Authority to promote its commercial business and to develop more adequate liaison with trucking and bus company officials.

Colonel Brill has advised the truckers that the Authority currently is pursuing plans to design and build additional terminal points on Thruway property where the tandems may be assembled and broken up, so their trailers can be drawn over regular highways as single units. The Authority now maintains temporary assembly points at seven sites.

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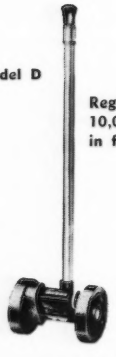

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Research on College Traffic Problems at University of Illinois

Traffic problems—vehicular and pedestrian—peculiar to college campuses are going to be studied at the University of Illinois in the first major research ever made on this subject.

Establishment of a traffic engineering unit in the physical plant department has been announced by Charles S. Havens, director. Two joint staff appointments will be made by that department and the College of Engineering.

Prof. John E. Baerwald, traffic engineer in the college, will devote two months this summer to the project, and part time during the coming year.

George W. Greenwood, research associate in civil engineering, as Prof. Baerwald's chief assistant will give full time this summer and half-time afterward.

Increased use of automobiles by students and staff, growth of campuses and spread of buildings as enrollment increases, have brought problems which call for study by trained traffic engineers, Havens said.

Research will attack immediate problems of traffic and parking—including automobiles, bicycles, and pedestrians, on or affected by the university and its activities. Studies of movement of people and vehicles and of parking will be made for the University's future development and building plans.

Basic information developed will be published for benefit of all college and university campuses, their problems and planning as a contribution to the science of traffic engineering.

Nominations Due Now For Hoffman Award

Nominations are invited for the 1959 Paul Gray Hoffman Award for outstanding professional service in highway safety.

Persons eligible for the award include educators, engineers, enforcement officials, motor vehicle administrators, researchers, organization staff members and others who make their careers in traffic safety. Candidates must be currently employed in and draw their principal means of livelihood from any of the activities embraced in the Action Program of the President's Highway Safety Conference.

State Highway Commissioner Dwight R. G. Palmer looks on approvingly as Ralph L. Fisher, of Stockton, Assistant Supervising Engineer of the State Department's Bureau of Location and Design, accepts National Traffic Engineering Award. Presentation was made June 11 by Edward J. Nugent, Traffic Engineer for the Association of Casualty and Surety Companies on behalf of that organization.

Mr. Hoffman, donor of the award, was a pioneer in the nation's traffic safety movement and the first President and Chairman of the Foundation. Former head of the Studebaker Corporation, he later served as ECA Administrator and U. S. delegate to the United Nations.

The board of judges for this top professional honor includes General Alfred M. Gruenther, President, American Red Cross; Dr. John A. Hannah, President, Michigan State University; Mrs. Raymond B. Sayre, Chairman, Women's Group, President's Committee for Traffic Safety; Herschel D. Newsom, Master, The National Grange; and W. Earl Hall, Editor, Mason City (Iowa) Globe-Gazette.

This year's recipient of the Hoffman Award will be the third to be chosen annually over a period of 10 years. Previous winners were Dr. Herbert G. Stack, former director of the New York University Center for Safety Education, and James Stannard Baker, Director of Research and Development, Traffic Institute, Northwestern University.

Award nominations may be made by an individual or by any local, state or national group. Each nomination must be accompanied by a brief statement (1,000 words or less) setting forth the candidate's traffic safety accomplishments. The record may cover any period of time, *recognition not being limited to annual performance.* Supporting evidence in the form of testimonials, clippings, reports, photographs, etc., may be included. Elaborateness of exhibits, however, will not be a factor in the decision of the judges. No special entry blanks are required.

Closing date for the 1959 award is September 1. All nominations should be addressed to the Automotive Safety Foundation, 200 Ring Building, Washington 6, D. C.

Law and Laymen Conference Being Held At Miami Beach

A conference sponsored by the American Bar Association in cooperation with the President's Committee for Traffic Safety is being held at Miami Beach, Fla., August 24-25.

The purpose of the conference is to strengthen the traffic court. As pointed out by Associate Justice of the Supreme Court, Hon. Tom C. Clark, "it is in these lower courts that many people gain their only experience with the American Judicial system. More than four million Americans appeared as litigants in traffic courts last year. Attitude toward law is hardened in this crucible of justice. Proper attitude

is a fundamental of traffic safety."

The objective of the conference is to acquaint lawyers and other citizen leaders with the importance of traffic courts in our American System of justice and to mobilize these citizens for the improvement of the courts in their home communities.

500 "Walk-Don't Walk" Signals for N. Y. City

New York City's 1959 Pedestrian Safety Campaign is being highlighted by the installation of 500 new "Walk-Don't Walk" signals.

The corner of 42nd Street and Broadway was the first of 100 intersections throughout the five boroughs to receive the new signals.

The pedestrian safety education program, initiated in 1958, produced fewer pedestrian accidents in New York City during 1958 than in the last ten years.

The new "Walk-Don't Walk" installation program will increase the existing city-wide total by 50% bringing the number of pedestrian signals to 1,630.

(Continued on page 46)

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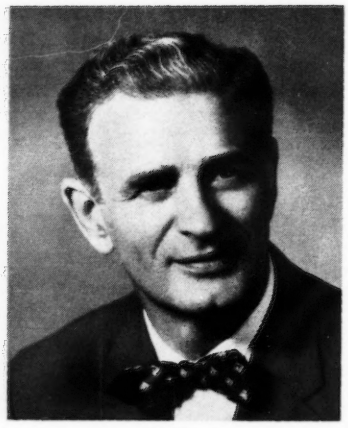
New Appointments



Leslie Williams Takes UN Traffic Post In Turkey

Leslie Williams (Mem. ITE), President of Coordinated Planning Services of Philadelphia, and former deputy commissioner of the Dept. of Streets of Philadelphia, has been named United Nation's traffic advisor to the Turkish Government for a one-year period. He is the first such traffic expert retained by the United Nations for assignment to member governments.

Mr. Williams will advise the Turkish Government on necessary steps to reduce the cause of accidents and expedite traffic, to assist in the revision of existing traffic legislation and conduct a course on Highway and Transportation Planning at Middle East Technical University in Ankara.

A graduate of Harvard University, Mr. Williams has had a long and active career in the traffic engineering field. He was an instructor in Traffic and City Planning at Yale University from 1938 to 1941; Engineering Director, Civic Planning and Traffic Board, Providence, R. I. 1941-44; Engineering Director, Governor's Commission Metropolitan Transportation, R. I., 1942-45; City Planning and Traffic Engineer of the American Transit Association in New York 1944-48; Traffic Engineer of the Automobile Club of New York 1950-52; and deputy commissioner, City Traffic Engineer of the Dept. of Streets in Philadelphia, 1952-53. He has been President of his own consulting firm since that date.

Donigan Named Acting Director, Traffic Institute Northwestern University

Robert L. Donigan has been named acting director of the Traffic Institute of Northwestern University.

General counsel for the Institute since 1947, Donigan was appointed by Franklin M. Kreml, director of the University's Transportation Center, of which the Traffic Institute is a division. Kreml said Donigan will serve as interim director of the Institute until a permanent successor to Ray Ashworth can be named.

Ashworth resigned June 30 as director of the Traffic Institute to become director of the newly-established Field Service Division of the International Association of Chiefs of Police, with headquarters in Washington, D. C. He will continue as director of the Traffic Division of the IACP, which, it is expected, will be housed with the new Field Service Division in Washington.

Donigan was assistant state's attorney of Cook County, Ill., for 18 years before joining the Traffic Institute staff in 1947. As acting director of the Institute, he will administer and coordinate the organization's activities in training, research and development, and publications.

Job Changes

Walter Kudlick—formerly Engineering Specialist with Edwards & Kelcey of Newark, New Jersey; now Chief Programmer with Parsons, Brinckerhoff, Hall & MacDonald of New York, New York.

William J. Bartels—formerly Principal Traffic Engineer with the New Jersey Bureau of Traffic Safety of Trenton, New Jersey; now Traffic Planning Engineer for the City of White Plains, New York.

Charles E. McLeroy, Jr. — formerly Traffic Engineer Aide for City of Lubbock, Texas; now Senior Traffic Engineer for the City of Corpus Christi, Texas.

Keith W. Graham—formerly Associate Traffic Engineer II with the State of Nebraska Department of Roads; now Assistant Traffic Engineer with the City of Wichita, Kansas.

Ralph E. Schofer—formerly Traffic Engineer with Wilbur Smith & Associates in New Haven, Connecticut; now with Hardesty & Hanover in New York City, New York.

Robert J. Allen—formerly Assistant Manager of Accident Prevention Department with the Association of Casualty & Surety Companies in New York, New York; now Director of the Arizona Traffic Safety Foundation in Phoenix, Arizona.

Title Changes

John L. Gallagher, Jr.—is now Chief Traffic Engineer for the City of Columbus, Ohio; was Assistant Traffic Engineer.

Edwin H. Miller—is now District Traffic Engineer for the Michigan State Highway Department; was Assistant District Traffic Engineer.

Ervin R. Leiser—is now Assistant Superintendent for the Bureau of Traffic Engineering & Electrical Services for the City of Milwaukee, Wisconsin; was Senior Traffic Control Engineer.

E. A. Barton Opens Consulting Offices

Eugene A. Barton (Mem. ITE), formerly Director of the H. K. Ferguson Company's International Traffic Engineering Division, has established consulting offices in Cleveland, Ohio with headquarters in the Cleveland Transit Building. Principal fields of service offered by his firm, E. A. Barton and Associates, will include traffic, parking, highways, economics, financing aid, city planning and urban redevelopment.

Mr. Barton's experience in traffic engineering numbers 25 years — from April 1938 to June 1941 he served as Aide to the Secretary-Treasurer of the Institute, Harold F. Hammond, during the period when ITE headquarters' offices were located in downtown New York.

During recent years Mr. Barton has been devoting a considerable amount of extra-curricular time to the cause of improving traffic conditions. In addition to his duties as a Director of the Institute of Traffic Engineers, he has been most busily engaged in the affairs of its Ohio Section Chapter, and locally, in the Cleveland Metropolitan Area, he has been chairing an active Traffic Engineering Committee and a series of sub-committees serving 58 municipalities and the City of Cleveland. He is also a member of the Governor's Traffic Safety Committee.

Walter K. Fleming Dies Suddenly

Walter K. Fleming (Assoc. Mem. ITE) and Vice President of the Virginia Transit Company, Richmond, Va., collapsed and died Saturday evening, June 20th, at his office.

Mr. Fleming originally joined the Virginia Transit Company in 1945 as a traffic consultant and in 1958 was made a Vice President of the Company. He was a member of the Rotary Club and a director of the Central Richmond Association and its retail executive committee.

A native of Pennsylvania, Mr. Fleming was a graduate of Thiel College. Surviving are his wife, Mrs. Mary Ellen Fleming, and two daughters, Miss Sandra Fleming and Mrs. Grover W. Alspaugh.

THE SPEED FACTOR

(Continued from page 17)

derived is a measure of the chances of being involved in an accident at any particular driving speed.

Computations were made for each speed group, and the results are plotted as the solid line in figure 2. It is evident from the curve that the involvement rate is highest for the lower-speed drivers, reaches a low point at about 65 miles per hour, and increases beyond that speed.

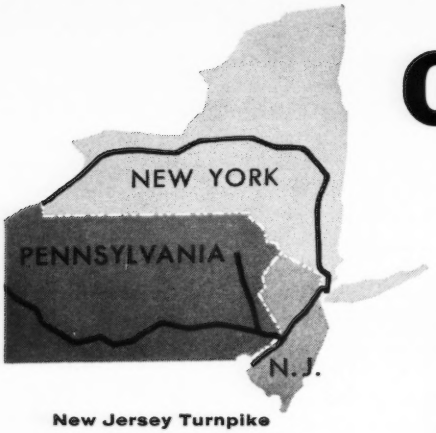
It is important to recognize that the relationships shown in Figure 2 were obtained from research on operating records for open rural highways where the design was reasonably adequate for the traffic, where normal driving speeds averaged 52 miles per hour, and where no particular obstructions to free-flowing traffic existed. It is well recognized that any speed, either high or low, may be unsafe, or safe, depending on the conditions that prevail.

Care is needed in interpretation of the results of this research; certainly it should not be used to attempt to discredit realistic and proper speed control programs. Thus it may be in order to add a few comments on the methods employed in this study.

The work was performed on 35 selected highway sections in eleven States. The sections may be characterized as main rural highways of reasonably adequate modern design. They were selected to avoid extremes in design, traffic and topographical conditions such as sharp curves, reduced speed zones, heavy congestion, major intersections and urban or suburban development, and were quite homogeneous within themselves and throughout the particular States in these respects. The results could not possibly apply to urban conditions, reduced speed zones, or locations where the speed is affected appreciably by traffic density, roadside activities and other factors.

The States varied from Connecticut to Arizona, and the spread of traffic volumes was from relatively low to moderately high. In general, the sections could be said to be representative of our better rural highways. Twenty-two of the 27 two-lane sections had volumes below 5000 vehicles per day, and six of the eight four-lane sections had volumes below 15,000 vehicles per day. Only a very few of the sections were operating anywhere near their traffic capacity. The findings, therefore, apply to highways where traffic moves freely for essentially all hours.

An examination was made of a number of individual sections, devoloping rate curves by section and by State. Where sufficient data are available for statistical stability, we have found essentially the same "reverse J-shaped" curve as given by the total national experience. While there were some variations in magnitude, the patterns are quite consistent. In other words, they show a high involvement rate at the lower speeds, a decrease in the rate at moderately high speeds, and an upturn in the rate at speeds above that point.



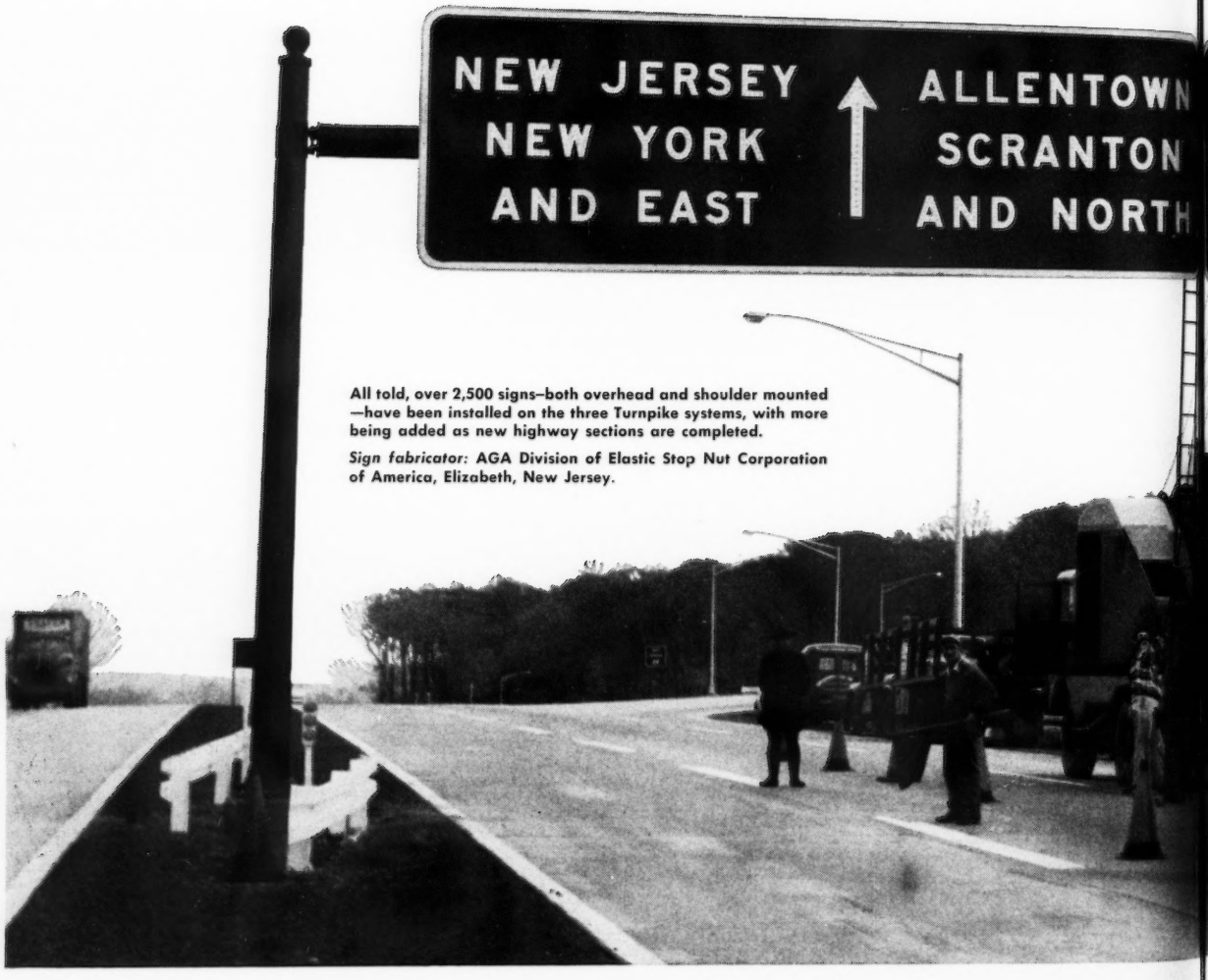
New Jersey Turnpike
New York State Thruway
Pennsylvania Turnpike

Overlaid plywood on the new

KING SIZE OVERLAID PLYWOOD SIGNS take the guesswork out of motoring along the new controlled access highways that speed traffic to and from the busy Eastern metropolitan areas.

Strategically located and reflectorized for nighttime legibility, these bright, easy-to-read signs make the New York Thruway and Pennsylvania and New Jersey Turnpikes a prime example of efficient highway signing. And because they cost less than signs of other materials—both initially and in long-term maintenance—overlaid plywood helps do this better signing job for less money.

Signs of overlaid plywood stand up better under severe weathering, deliberate or accidental abuse. Plywood's strength and stiffness simplifies framing. Standard panels can be easily cut or combined to make signs of any size or design. The durable plastic-like overlay prevents checking, provides an ideal base for paint or reflectorizing.



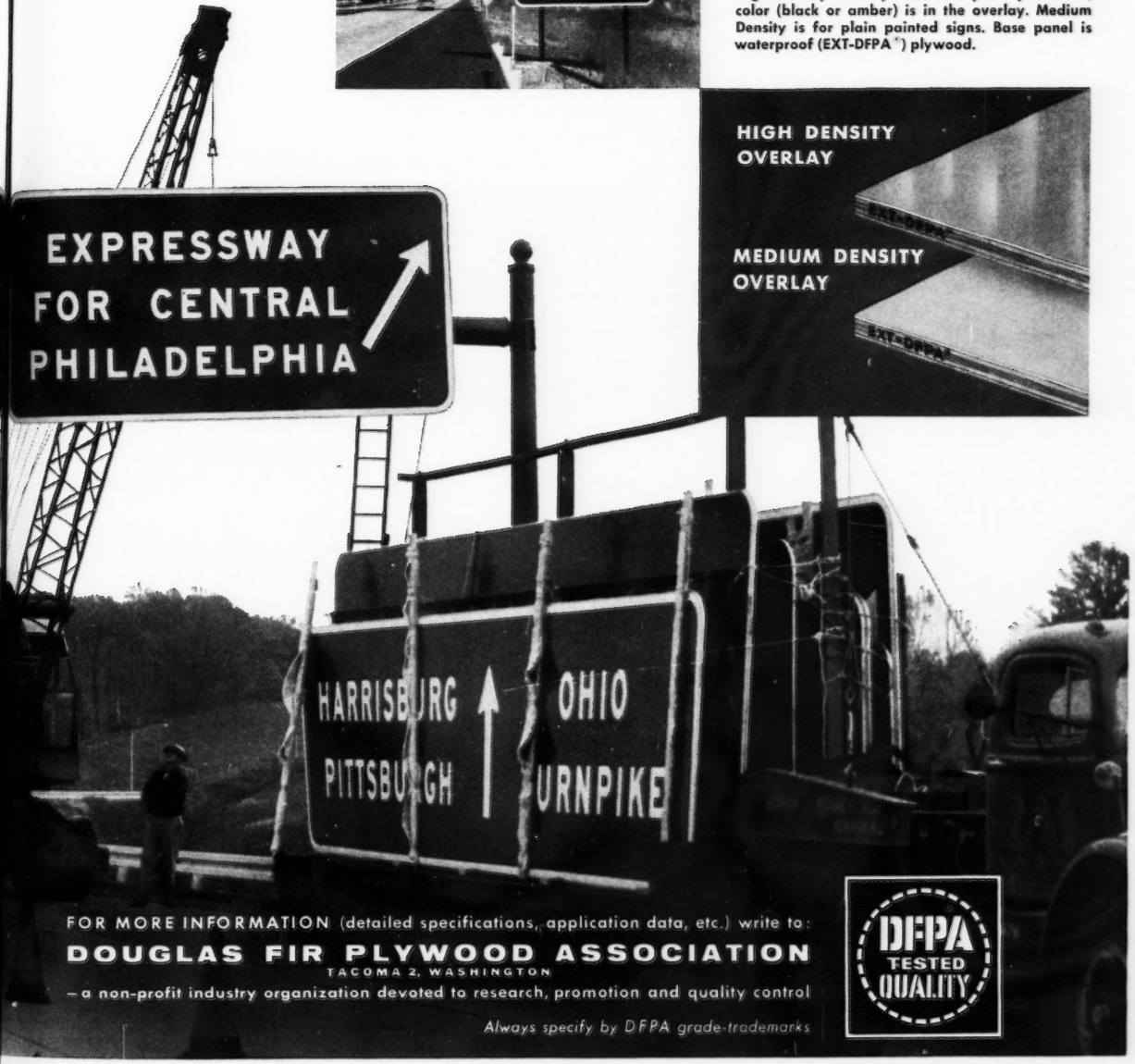
All told, over 2,500 signs—both overhead and shoulder mounted—have been installed on the three Turnpike systems, with more being added as new highway sections are completed.

Sign fabricator: AGA Division of Elastic Stop Nut Corporation of America, Elizabeth, New Jersey.

helps cut signing costs eastern turnpike systems

Overlaid plywood sign panels are stronger, more durable than metal. On shoulder mounted signs, fir plywood's greater stiffness means backing or supporting framework can be eliminated.

Durable overlay eliminates checking, grain raise. High Density overlay needs no paint protection; color (black or amber) is in the overlay. Medium Density is for plain painted signs. Base panel is waterproof (EXT-DFPA ") plywood.



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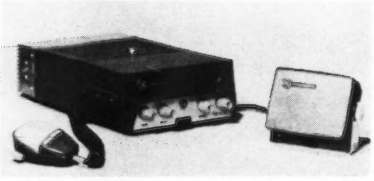
Advance Design of Two-Way Radio

General Electric Company has unveiled an advance design of transistorized two-way radio equipment containing the highest powered transistorized models, the smallest sizes and the lowest battery drain ever to be made commercially available in the mobile communications field.

To be marketed immediately, the equipment has been designated as the General Electric Transistorized Progress Line. It will be available in units up to 75 watts — the highest output achieved to date in transistorized communications.



When on "standby" (full sensitivity, ready to respond instantly to a call with full volume output), this new 75 watt unit uses a negligible 0.040 amps. This is so low, the company points out, that a driver can leave his radio in the standby position continuously and the drain on the car's battery would be like the drain of the vehicle's clock.

The smaller size makes the units the most compact and most adaptable ever placed on the market (according to the company); because they will fit better under the dash of a car, more leg room is gained. It now becomes possible for as many as three persons to fit in the front seat, where previously the space for one passenger frequently was taken by larger radio equipment.

New Fluorescent Paints Being Used by Chicago Sanitation Dept. in Test

A new safety paint is being used over 100% of the surface of trucks of the Department of Sanitation in Chicago. Using one of the colors manufactured by Lewter Chemicals, Inc.,—yellow-orange—in order to give high visibility, anti-collision protection, the Department is testing the effectiveness of fluorescent color on their vehicles which are continually entering or coming out of "blind alleys" or being parked where approaching traffic must veer around them.

HI-VIZ Fluorescent Safety Paints are available in Red-Orange, Yellow-Orange, Red, Pink, Cerise-Red, Gold-Yellow, Lemon-Yellow and Green. Their high visibility factor recommends them to many municipal uses such as application on fire hydrants, litter baskets, alarm boxes, police, fire and other emergency vehicles, traffic control signs and devices, highway stripings, barricades, signal paddles and flags, radiation protection shelters, tollway and expressway markers, etc. New HI-VIZ Fluorescent Safety Paints combine great brilliance and lasting weatherability, and according to the manufacturer, will maintain their brilliant colors for periods up to twenty-one months or more, depending on method of application and geographical location. They may be applied by brush, roller or spray equipment and are also available in aerosol containers. A detailed, illustrated brochure showing actual HI-VIZ applications, design hints and application instructions is available from Lawter Chemicals, Inc., 3550 Touhy Avenue, Chicago 45, Illinois.

Michael Flynn Bridge Railings Used for New Type of Bridge Lighting

A unique new type of aluminum bridge railing that serves as a "continuous lamp post" was recently unveiled by the New Jersey State Highway Dept. Installed on the Route 72 Manahawkin Bay Bridge, 4800 ft. of bridge railing, manufactured by Michael Flynn Manufacturing Co., has luminaires spaced 2 ft. apart along the top rail to give the "waist-high" lighting.

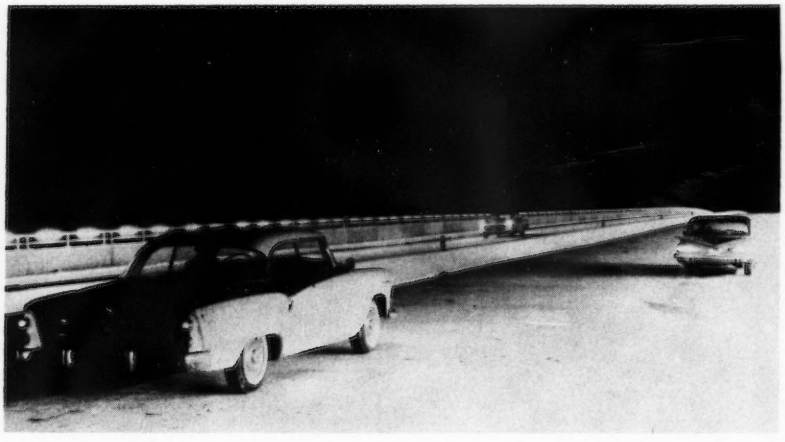
The design for this novel system of roadway lighting was worked out by the New Jersey State Highway Dept. and is the result of a "pet idea" which State Highway Commissioner Dwight R. G. Palmer first conceived a decade ago. To make this idea a reality, the Aluminum Div. of Michael Flynn Manufacturing Co. of Philadelphia extruded and fabricated railings that exactly met the New Jersey specifications.

In construction, the bridge railings measure 1½-ft. high and are mounted on a parapet that brings their overall height to 50 in. The top rail is elliptical in shape, measuring 7¾ in. by 5 in. Fluorescent luminaires measuring 42 in. long are recessed into cut-out sections of this rail at intervals of 2 ft. These luminaires, which were designed and supplied by General Electric, are mounted so that all light is directed at the roadway, providing an even illumination of its entire surface. In addition to putting all the light where it belongs, this lighting system is very easy to service without blocking the roadway.

An aluminum sleeve that fits inside the top rail between the various sections protects electrical wires running inside the railing. This sleeve also acts as an expansion joint to compensate for thermal expansion and contraction between the rail sections.

Other dimensions for the Michael Flynn bridge railing are: 3-in. ips post, 2-in. ips lower rail and a 12-in. by 6-in. by ¾-in. base plate. Even the aluminum anchor bolts were supplied by Flynn.

The entire Manahawkin Bridge railing was extruded, fabricated, assembled



and welded by Flynn and shipped in sections to the bridge site where it was erected by Cornell & Co., Inc., Woodbury, N. J. under the auspices of the general contractor, Conduit and Foundations of Philadelphia.

Light-weight but strong, Flynn aluminum bridge railing does not require lift trucks or cranes for erection purposes. This Manahawkin railing was erected by two men, with wrenches as their principal tools. And because the Flynn bridge railing is non-rusting aluminum, it never needs painting.

New Mercury Luminaire Line and Photoelectric Control Announced by GE

An all-new line of mercury vapor street and highway luminaires — the Type M—and a new photoelectric control have been announced by General Electric.

The new luminaires feature sleek modern appearance, easier installation and maintenance, and higher lighting efficiency. They are available in three basic units: The M-250 (175 or 250 watt), M-400 (400 watt), and M-1000 (700 or 1000 watt).

Locking type receptacles for integral mounting of the new cadmium-sulphide control are available on all Type M units as well as all current General Electric fluorescent and filament luminaires.

"Power Pack" built-in ballasts, pioneered by General Electric, will be standard equipment on the new luminaires although all three units will be available without them.

Main streets, traffic streets, highways, shopping centers and parking lots are ideal applications for this type unit since $50 to $65 savings per pole may be realized by rapid, simplified installation.

Two unique features allow extremely flexible use: A multi-position socket that is adjustable in the field to give proper light distribution with clear white and color-improved lamps, and an adjustable clamp in the slipfitter permitting the units to be installed on either 1¼ or 2-inch brackets.

Other features are lower ballast losses, greater refractor life through a new suspension system and lower operating temperatures, and easier maintenance and cleaning due to the generous access opening.

Die-cast construction is used to provide maximum strength and durability.

General Electric research with mercury luminaires has produced an acrylic refractor, available on the M-250 which will reduce maintenance problems caused by vandals. During its extensive tests, rocks and BB's simply bounced off. No ill effects showed up on the refractor after testing with industrial smoke, blowing sand or salt water spray.

The new dusk-to-dawn control has an exclusive sensing element hermetically sealed in a special atmosphere for humidity protection and long life. Simplified circuitry, with fewer operating parts, assures maximum reliability.

The control is simply plugged into receptacles on the luminaires and with one twist is locked into working position. The on-off light level may be set externally with a simple screw adjustment on the underside of the base.

New Data Available On Steel Sign Posts

A Table of Recommended Steel Sign Post (flanged channel) Data has recently been completed by the Pollak Steel Company of Cincinnati. The table has been computed in accordance with numerous tests and research as conducted by the University of Cincinnati Engineering laboratory. This is the first time such information has been assembled and made available to all Traffic Engineers.

This table has been prepared using rib-bak channel section weights of 2.0#, 2.25#, 3.0# and 4.0# per foot. The recommended erection tables include one, two and three post assemblies in both rib-bak and the now popular Piggybak application.

There are two separate and distinct tables. One is based on a minimum yield point of 60,000 p.s.i. The other is similar, but based on 50,000 p.s.i. The data is based on resistance to a 100 mile per hour wind velocity, as that figure has been previously established.

The tables do not include, nor refer to, overhead signs supported structurally above traffic flow.

The posts, as recommended by the 60,000# yield point design tables, will not break nor become a safety hazard in even a 100 mile per hour wind. The post would take a permanent set *only* if the wind velocity is in excess of 100 miles per hour and the resultant pressure over the entire sign area is greater than 30#/sq. ft.

These tables are available upon request, on letter-head stationery.

High Density Overlaid Plywood

A new booklet describing the characteristics of Kimpreg high density overlaid plywood has been published by Kimberly-Clark Corporation, Neenah, Wisconsin.

The booklet reveals how overlaid plywood is manufactured and lists case histories of successful end uses of this plastic covered building material.

Overlaid plywood is especially recommended for highway and street signs and is being used for this purpose by many states, counties and municipalities according to the Douglas Fir Plywood Association.

High density plywood is made by applying Kimpreg cellulose fiber sheets impregnated with phenolic resin which becomes a smooth hard plastic armor when applied to exterior grade plywood at the time of its manufacture.

The booklet may be obtained by writing to the Douglas Fir Plywood Association, Tacoma, Washington, or from Kimberly-Clark, which manufactures the Kimpreg covering material.

Tear Drop Curves to Simplify Highway Work

Tear drop curves that simplify highway interchange design have been introduced by Keuffel & Esser Co., Adams and 3rd Streets, Hoboken, N.J.

Recommended by the company as especially effective in short-radius work such as limited-speed controls, exits, entrances, and acceleration/deceleration lanes, the new curves can be used in any layout work involving circles and arcs.

According to K & E engineers, the new templates simplify all short radius work that previously required the time consuming and tedious process of drawing with a combination of various curves to obtain one curve design.

All curves in this new series have double tangents, two radial lines and a hole for marking the center of arc. They can be used on drawings to any scale. Using the double tangents, curves tangent to a line can be drawn in four directions without removing the curve from the drawing. In addition, curves as long as 270 degrees can be drawn in one operation.

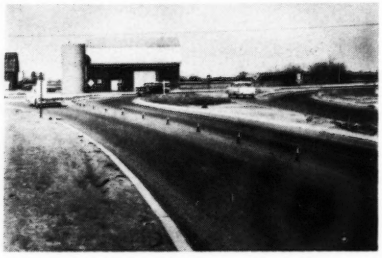
The construction of the two radial lines with the center marking hole simplifies locating points of tangency for simple, compound and reverse curves.

Made of transparent, durable Luxylite, the new Tear Drop Curves are available in complete sets as radius or degree curves to the Arc Definition, eleven curves to a set. Complete instructions are packed with each set. They may also be purchased individually.

Pylacon Traffic Markers Guide Motorists Through New Intersection

Pylacons are offered as a solution for keeping converging traffic in separate lanes and to maintain even vehicle flow with a minimum of interrupting delays on newly constructed highways by the Pylacon, Inc., 48 N. Westwood Ave., Toledo, Ohio.

Pylacons are flexible, compound units that sound a warning if struck but do not damage the driver's car. Excellent visibility for the 12″ traffic markers is obtained by use of Federal Yellow molded into the top 5″ of the units. Reports are that even during heavy weekend traffic motorists have experienced no aggravating tie-ups.



Outdoor Fluorescent Lighting Fixtures

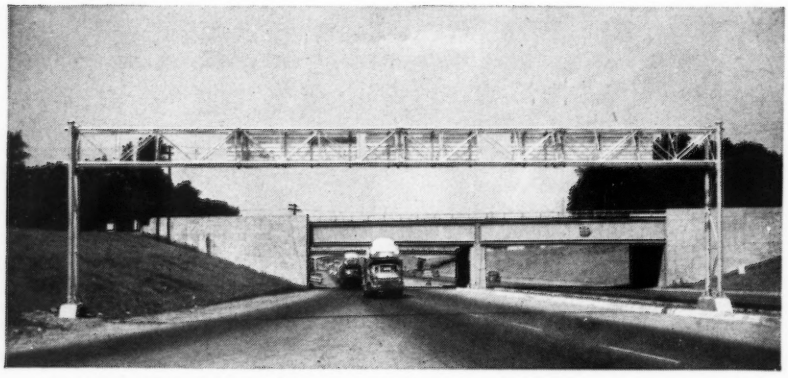
A new line of outdoor fluorescent lighting fixtures for illumination of streets, expressways, shopping centers and service stations, has been introduced by Metalcraft Products Company, Inc., manufacturers of fluorescent lighting fixtures, Philadelphia, Pa.

Called the "Broadstreeter," the aluminum, fully-weatherproofed fixture is designed to provide more light per watt with less glare. The new luminaire emits good color rendition with a low glare factor. It is available in 4 and 6 foot sizes. The aluminum body is heliarch seam welded to cast aluminum ends, and the gasket-sealed acrylic diffuser creates a rust-proof and bug-proof fixture. The parabolic reflector is of polished aluminum. The "Broadstreeter" is a self-contained unit, ready for mounting and wiring.

According to the manufacturer, the "Broadstreeter" has a low maintenance cost. The diffuser hinges from either side for easy servicing. Lamp and transformer replacement cost is less than in other types of outdoor luminaire of comparable wattage.

The new Metco fixture is designed for the latest high wattage lamps and standard high output lamps. It is a 110-125 volt, 60 cycle operation, and is available for operation on other voltages. The units are union wired.

Catalog sheets containing complete specifications are available from the manufacturer.



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Rockafellow Joins Automatic Signal

Richard M. Rockafellow has recently joined the Sales Engineering Department at Automatic Signal Division, Eastern Industries, Inc., Norwalk, Connecticut. Announcement was made by Paul L. Green, Sales Manager (Member I.T.E.)

Rockafellow, a graduate of the University of Michigan with a B.S. in Civil Engineering, was awarded the Automotive Safety Foundation fellowship to the Yale Bureau of Highway Traffic, Class of 1959. While at Yale, he served as Secretary-Treasurer of the student chapter of I.T.E. He was also formerly associated with the Michigan State Highway Department.

New Publications

The Municipal Year Book, 1959

Orin F. Nolting and David S. Arnold, editors, International City Managers' Association, 1313 E. 60 Street, Chicago, Ill., 606 pp., $10 postpaid.

This 26th Annual Volume contains a comprehensive view of urban government in the U. S. Highlights of the 1959 edition include special sections on urban renewal and classification of cities. The publication includes 22 major tables with a vast amount of information on the organization, personnel, finances, and activities of cities in the U. S. The urban renewal section shows comprehensive information for 252 cities over 5,000 population on programs, organization, number of employees, expenditures, elements approved in the workable program, and number of persons relocated because of urban renewal projects. Data on economic classification are shown for standard metropolitan areas and all cities over 10,000 for economic base, metropolitan status, rent level, per cent of males in white collar jobs, manufacturing ratio, and employment-residence ratio. The data provide useful intercity comparisons on economic base.

Of unusual interest in this Volume is Table XIX which presents, for the first time, Traffic Engineering data for cities over 10,000 as of year ending 1958. This Table gives such statistics as "Year Traffic Ordinance Last Revised;" "Who Serves as Traffic Engineer;" "Full Time Traffic Engineer's Salary;" "Designates Traffic Devices;" "Undertakes Traffic Projects;" "Federal Highway Program Study;" "Citizens' Traffic Safety Committee;" "Yield Right of Way Sign, Year;" "Limits Streets for Large Trucks."

Motor Truck Facts, 1959 Edition

Automobile Manufacturers Association, Inc., New Center Building, Detroit 2, Michigan—48 pp.

The statistical handbook reveals that truck transportation now employs 7,400,000 persons, or one out of every ten employed men and women in the nation.

Last year, 11,200,000 private and publicly-owned trucks were in use on U. S. streets and highways—setting a new record. Trucks account for nearly 17 per cent of total U. S. motor vehicle registrations.

The fact book also shows that trucks haul 1.6 billion tons of freight a year—more than any other type of carrier. Trucks are the prime carriers of the nation's food products, bringing 87 per cent of livestock, and 61 per cent of fruits and vegetables to major markets across the country, the AMA reports.

The 1959 edition, with 48 pages of charts and tables, also covers such subjects as truck production, highways, scrappage and special uses of trucks.

Driver Education Reduces Accidents And Violations

A Summary of 33 studies in 23 states and D. C. American Automobile Association, 1712 G Street, N.W., Washington 6, D. C. Single copies free—quantity 4 cents each.

This booklet is an effort to summarize all existing studies known at present with the thought that such information will help to encourage the Driver Education program. It examines the value of the Driver Education

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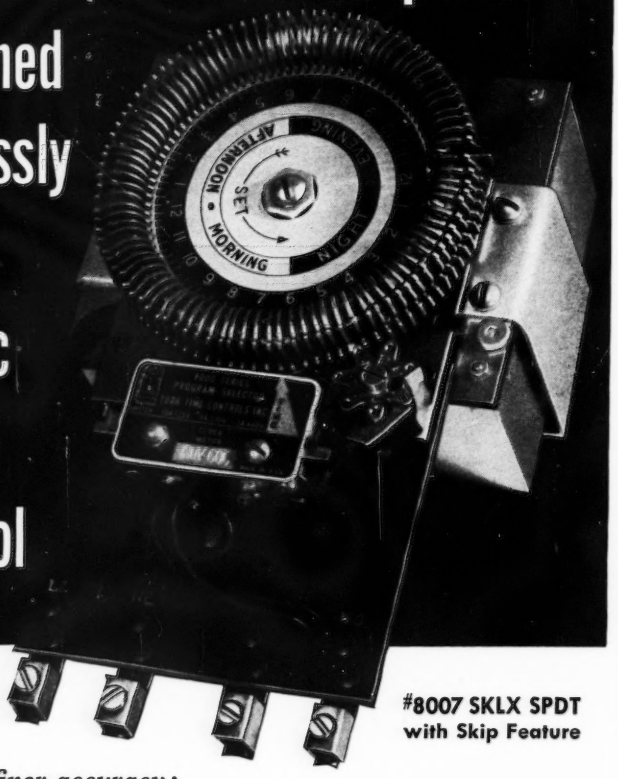

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courses now being offered in over 10,000 high schools, and gives statistics to indicate accident and conviction data on trained and untrained drivers.

Characteristics of Vehicle Operators

Highway Research Board of the National Academy of Sciences—National Research Council, 2101 Constitution, Washington, D. C. 37 pp., $0.80.

This bulletin includes five papers sponsored by the Committee on Road User Characteristics and presented at the 37th Annual Meeting of the Highway Research Board, as follows:

"Driver Characteristics and Speed Performance Related to the Facility," by Donald E. Cleveland.

"An Investigation of the Role of Psychological Factors in Motor Vehicle Accidents," by Robert V. Rainey, John J. Conger, Herbert S. Gaskill, Donald D. Glad, William L. Sawrey, Eugene S. Turrell, Charles R. Walsmith and Leo Keller.

"Relationships Between Driving Records, Selected Personality Characteristics, and Biographical Data of Traffic Offenders and Non-Offenders," by Earl Davis Heath.

"Age and Fatal Motor Vehicle Accidents," by Clifford O. Swanson, Lillian C. Schwenk and A. R. Lauer.

"Final Report of Study on the Effect of a Periodic Refreshment Pause on Simulated - Automobile Driving Performance Efficiency," by Virtus W. Suhr.

Coming Events

September 7-11—ILLUMINATING ENGINEERING SOCIETY—
National Technical Conference, Hotels Fairmont and Mark Hopkins, San Francisco, California. Contact: IES, 1860 Broadway, New York, N. Y.

September 14 - 17 — INSTITUTE OF TRAFFIC ENGINEERS —
29th Annual Meeting, Commodore Hotel, New York, N. Y. Contact: ITE, 2029 K St. N.W., Washington 6, D. C.

September 20-24 — AMERICAN TRANSIT ASSOCIATION—
Annual Meeting, Hotel Leamington, Minneapolis, Minn. Contact: ATA, 355 Lexington Avenue, New York 17, N. Y.

October 11-16 — AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS—
Annual Meeting, Hotel Statler - Hilton, Boston, Massachusetts. Contact: AASHO, 917 National Press Bldg., Washington 4, D.C.

October 19-22 — INTERNATIONAL MUNICIPAL SIGNAL ASSOCIATION—
Annual Conference, Stardust Hotel, Las Vegas, Nevada. Contact: IMSA, 130 West 42nd St., New York 36, N. Y.

Technical Notes

The Technical Council of the Institute of Traffic Engineers met in Eugene, Oregon, on June 16 and 17. Among other items of business the Council heard a report of joint committee activities, submitted by D. Grant Mickle, Head of Department No. 1. Believing that this report, as well as other work of the Council, would be of general interest to the members of the profession, the Council suggested that a section of the magazine be devoted each month to the Technical Council. This is the first of such sections.

ITE Participation in Activities of Other Organizations

Report of Department No. 1
of
ITE Technical Council
D. Grant Mickle, Chairman
June 16, 1959

1. National Joint Committee on Uniform Traffic Control Devices—Wilbur S. Smith.

At the meeting of the Committee earlier this year in Washington, it was agreed that a revised manual should be completed and published as soon as possible. After considerable discussion it was decided that the only portion of the manual that might not be completed easily within time to get the whole manual published this year, was the part on signals. Mr. George Howie, Chairman of the Sub-Committee on Signals, subsequently agreed to speed up the work of the Sub-Committee and get a revised draft of the signal section of the manual completed by late summer—about August. This will allow time for writing and editing activities which will permit the manual to go to the printer by the end of 1959. Everyone agrees that the urgency of the revisions makes it highly desirable to have the manual completed and ready for general distribution as soon as possible.

To summarize, I think that we can all take the optimistic view that completion of the manual will be a reality in 1959, even though publication will be later, and that this will be a very important step in the current emphasis being placed on the National Highway System. It might be also pointed out that in the revisions, consideration is being given to the standards for interstate signings and markings on which there was a separate specification issued by the American Association of State Highway Officials. We do not anticipate any serious conflict.

2. National Committee on Uniform Traffic Laws and Ordinances—John H. Mitton.

The National Committee on Uniform Traffic Laws and Ordinances has not met this year, and has been relatively inactive since completion of the project to combine the various Laws into the "Uniform Vehicle Code" in *1956* and the subsequent revision of the Model Traffic Ordinance.

However, the recently completed Highway Safety Study, of the Bureau of Public Roads places great stress on the importance of attaining uniformity in this field, and also points out that stronger efforts and continued attention will be required to stay abreast of the successful experiences and efforts of states and cities to meet the new conditions developing. It recommends that this important work be materially increased.

This report also calls attention to the need for study of suitable "rearward warning-light equipment", (particularly for use on freeways) to indicate disabled vehicles and others which are stopped or moving slowly, and for the marking and lighting of farm vehicles. The Sub-Committee on Vehicle Lighting met in New York City on March 3.

It appears therefore, that greatly increased activity of this Committee can be expected in the near future. Any items which ITE members wish considered, and particularly any dealing with the items mentioned should be submitted to your representatives for presentation to the full Committee.

3. Highway Traffic Standards Board of the American Standards Association —Nathan Cherniack.

Under date of October 16, 1958 the American Standards Association approved as an American standard ITE's Revised Technical Reports Nos. 1, 2 and 3, which deal respectively with: 1) adjustable face traffic control signal head standards (ASA, D-10.1-1958); 2) pre-timed fixed cycle traffic signal controllers (ASA, D-11.1-1958); and 3) traffic-actuated traffic controllers and detectors (ASA, D-13.1-1958).

Report No. 1 covering the standard for signal heads, recommends the materials and construction of the housings, and the minimum values of light transmission, as well as the chromaticity limits for the colors of the signals, red, yellow and green colors—used in traffic signaling, and the orange used for control of pedestrians. In addition to establishing, for the first time, color limits for the orange lens, the revised edition offers a redesigned chromaticity chart for all the lens colors.

Report No. 2 covers standards for traffic signal controllers operated either by an automatic controller or by means of a manual switch, as well as those in which a "walk" interval for pedestrians is actuated by a pedestrian detector. This standard gives general design requirements, requirements for non-interconnected controllers, for future interconnected controllers, interconnected controllers and for the master controller.

Report No. 3 covers standards for a number of different types of traffic-actuated controllers, including those that are actuated by pedestrians and those that are actuated both by pedestrians and by vehicles. It also covers traffic-actuated controllers with speed control functions as well as vehicle, pedestrian and radar vehicle detectors and associated equipment.

4. Roadway Lighting Committee of the Illuminating Engineering Society —Charles H. Rex.

During the past year or so this Committee has been largely engaged in active discussion of a subject which might best be reserved until conclusions are reached. It is hoped that some report will be available prior to the 1959 Annual Meeting of ITE.

T. J. Seburn is due to be made Chairman of this I. E. S. Committee, effective October 1, 1959.

5. U. S. National Technical Committee W-1.3.3 of the International Commission on Illumination—Charles S. Michalski.

Briefly, the current situation is as follows:

1. ITE specifications for yellow signals do not conform with U.S.N.C. proposals. We permit greener yellows than are allowed by other transportation services.

2. The U. S. National Committee recommends that a brighter red (yellower) be used in traffic signals. The red proposed is similar to that used by railroads in grade crossing warning flashers. It has much better transmittance than the red currently used in traffic signals.

3. The proposed changes in signal colors were demonstrated to members of ITE Committee 7A last July; to the audience at the Department 6 meeting at Miami Beach and at the meeting of the Highway Research Board Committee on Night Visibility last January.

4. The brighter red seems to be meeting with popular approval and is currently incorporated in ITE specifications for 12-inch traffic signals.

5. The redder yellow which the U. S. National Committee proposed was not favored by the majority. This was confirmed in a poll that I conducted by questionnaire.

6. Except for the impasse in regard to the yellow signal, the proposal of the U. S. National Committee for developing a U. S. Standard for the color of signal lights is desirable. I am hoping that some sort of compromise can be made so that ITE can endorse U.S.N.C. objectives.

It has taken over five years to reach the present status. This does not look like much progress. However, I feel that ITE should participate until there is a satisfactory resolution of differences. There is no reason signal colors of all transportation services should not be similar. The chairman of ITE Committee 7A plans to hold a meeting of his committee in May or June and at that time it may be possible to make more progress. In the meantime I will continue to try and obtain glassware suitable for actual field tests. Such glassware is not easy to obtain inasmuch as it has to be an off-color-lense out of current production—carefully matched to filters describing proposed colors.

6. National Research Council—Thomas J. Seburn.

The designation of an Institute of Traffic Engineers representative to the National Research Council is primarily in the nature of a liaison appointment. Consequently, the responsibilities of the ITE representative are somewhat limited to attendance at the Annual Meeting of the National Research Council and the Division of Engineering and Industrial Research of the Council.

While it must be recognized that the activities of the National Research Council are very broad in nature and only a very limited portion of the activity is to direct interest of the traffic engineer, it is felt highly desirable and significant that we are permitted to engage in such mutual interchange with other groups.

7. Traffic and Transportation Conference of the National Safety Council—David M. Baldwin.

The Traffic and Transportation Conference has been concerned with certain organization matters within the National Safety Council, and with safety projects not involving traffic engineers. We have participated in meetings concerned with the Annual Inventory, however, and have discussed the possibility of a workshop meeting of the Conference.

8. Advisory Council of the President's Committee for Traffic Safety—Matthew C. Sielski.

I don't have any significant information to give you pertaining to the activities of the Advisory Council of the President's Committee for Traffic Safety. Most of the activities have been centered about the Conference on the Law and the Layman but that does not particularly involve the ITE.

9. National Committee on Traffic Training of the National Safety Council—John E. Baerwald.

The Committee meets twice yearly during the annual meetings of the National Safety Council in October and the Highway Research Board in January. Within the last year the Committee has assisted in the preparation and distribution of "Courses in Highway Safety and Highway Traffic—A Directory of College and University Offerings." Over 11,000 directories have been distributed to college and university registrars, guidance officials, and a selected list of support organizations.

The Committee has assisted in the preparation of a companion piece to the Directory of College and University Course Offerings. This companion piece was a career guidance manual entitled "Careers in Highway Traffic Safety." Both publications are available for one dollar a copy from the National Education Association.

Sub-committees of the committee are currently working on the following topics:

1. Job analysis for various traffic safety activities
2. The development of a promotion and procedural manual for short courses
3. The development of training courses for:
   a. State traffic managers
   b. State and local safety organization members
4. The preparation of a manual for volunteer citizens' safety organizations.

Additional current activities of the Committee include a discussion of how the Committee can serve as a clearinghouse for training materials, the feasibility of a workshop on management training for top level safety administrators, the creation of college and university highway safety centers, and the recruitment and training of replacements.

10. Research Committee of the Advisory Council of the President's Committee for Traffic Safety—Kenneth G. McWane.

Under the sponsorship of this committee, a conference was held at Williamsburg, Virginia, during the week of February 23-28, 1958, to generate new ideas for traffic safety research, particularly in the field of human behavior. A brief summary report was published in Traffic Safety Research Review, June 1958, by the National Safety Council.

It was decided at the May 9, 1958 meeting of the committee to develop a more extensive report in each of the three general divisions considered at the Williamsburg Conference, namely:

a. A systems approach to traffic flow and driver behavior.
b. The psychology of driver behavior.
c. The social context of the automobile, its use and regulation.

On February 16, 1959, Merwyn A. Kraft, Chairman of the Research Committee, advised that progress still is being made on such a report, and that a Preliminary Report was completed and made available to C. W. Prisk, Director, Highway Safety Study. This Preliminary Report appears as "Appendix C" in House Document No. 93 of the 86th Congress, 1st Session, entitled "The Federal Role in Highway Safety."

A meeting of the Research Committee was tentatively scheduled for May 1959, but it was felt desirable to defer the meeting until after the Final Report of the Williamsburg Conference was available for review and discussion.

11. Joint AIP - ITE Committee — Alan M. Voorhees.

In connection with this Committee, I have met in various places with many of the members and have explored with them a possible report. At the present time, we are thinking of preparing a report that will be a simple statement of the professional responsibility of each group in carrying out transportation plans and programs in the urban area. We plan first to discuss the professional role of the traffic engineer as well as the planner, particularly the areas in which they have to work cooperatively. We plan to spell out by examples how the two professional groups can work cooperatively on (1) the development of standards and goals, (2) the gathering of facts, (3) the analysis of facts, (4) the development of the plan, and (5) the carrying out of the plan. We hope that such a simple document can be adopted by both of the governing bodies of these two Institutes.

Section News

INDIANA SECTION

The Indiana Section of the Institute of Traffic Engineers met jointly with the Ohio, Michigan and Ontario Sections in a District outing at Pokagon State Park on June 5-7, 1959. A total of 102 persons registered, including 14 members of the Indiana Section and their families.

The outing began with dinner on June 5 and ended after the noon meal on Sunday, June 7. In between these events the many facilities of the park were utilized by family groups and by organized events planned by the several committees for the outing. A technical session on Saturday morning from 9:30 to 12:00 was very well attended and very informative.

A business session was held by the members of the Indiana Section on Saturday evening, June 6 at 6:00 p.m.

SOUTHERN SECTION

Virginia Division

The second meeting of the Virginia Division, Southern Section, Institute of Traffic Engineers, was held at Hotel Roanoke, Roanoke, Virginia, on May 20, 1959.

Those attending were privileged to hear papers presented by William H. Gordon, Jr., Traffic Engineer, City of Newport News on the subject "The Influence of Interstate Highways on Urban Traffic"; Major E. W. Crews, Executive Officer, Virginia State Police on the subject "Virginia Motor Vehicle Laws"; Kenneth W. Smith, Director of Traffic, City of Alexandria on the subject "Progress in Metropolitan Traffic Engineering"; and a panel discussion on Current Urban and Rural Traffic Problems in Virginia, moderated by Fenton G. Jordan, Jr., Traffic Engineer, City of Norfolk and participated in by Eugene Clifford, Traffic Engineer, Richmond, Virginia; J. D. Sink, Traffic Engineer, City of Roanoke; Henry S. Hulme, Jr., Traffic Engineer, Arlington County; Jesse C. Bullock, Jr., Associate Traffic Engineer, Virginia Department of Highways, Richmond, Virginia. Questions from the floor indicated that there was considerable interest in all of the subjects presented.

METROPOLITAN (N.Y.) SECTION

Officers for 1959-60:

L. E. Bender ..... *President*
Warren Travers ..... *Vice President*
Ernest A. Boulding ..... *Secy-Treasurer*
54 Grove Ave., Maywood, N. J.

NEW ENGLAND SECTION

Matthew J. Huber ..... *President*
William R. McGrath ..... *Vice President*
Bernard B. Twombly ..... *Secy-Treasurer*
21 Hillsdale Rd., Medford 55, Mass.

WESTERN SECTION

Sacramento Area

Having legalized balloting by mail, the ballots for the 1959-60 officers were canvassed and the following men elected: Area Chairman, Charles E. Zell; Area Vice-Chairman, Lee D. Kies; Secretary-Treasurer, Maynard Glass. These officers will assume their duties following the Annual WITE Meeting.

Doug Carmody's fourth article in *Street Engineering* in the last 12 months will be published in the June or July issue. It tells of portable traffic signs used to make temporary replacements of regulatory signs that have been knocked down in the night or on weekends. The three earlier articles dealt with Modesto's Traffic Ordinance, its One-Way Streets, and its Off-Street Parking Program. Reprints are available from Doug.

Washington Area

Tom McLeod and Dick Carlson presided at the May 19th Washington Area Meeting at the Top of the Ocean Restaurant in Tacoma. Twenty-one members and six guests attended.

Nominations were held for Washington Area Co-Chairmen. Bob Curry of Seattle and Joe Thornton of Olympia, were nominated and approved by the attending membership. Roy Sawhill and Bob Curry of the 1959 Western Section Conference Committee reported that the Technical Program is just about shaped up and the financial outlook appears to be adequate.

The attending membership voted overwhelmingly to submit to the Western Section the City of Seattle for consideration as the site of the 1962 National ITE Convention. The 1959 Western Section Convention Committee headed by Bruce Culver recommended the action and submitted the report of Area Capability for approval of the Washington Area members.

C. K. "Squeeg" Glaze reported that a proposal was being considered to hold National ITE Conventions bi-annually and elect officers for a two-year tenure. He suggested that the Western Section membership consider the same proposal regarding District 6 and holding the Western Section conventions on alternate years. The purposes in mind are to encourage more participation at the conventions by holding fewer, and to allow officers sufficient time to more adequately carry out administrative programs and projects. He asked that all members give consideration to the pros and cons of such a proposal and submit comments to the Western Section officers.

Roy Sawhill reported that local membership would be eligible for association with the Puget Sound Engineering Council subject to defining the group and forming by-laws. A committee consisting of Roy Sawhill, John Mladinov and Bob Dunn was appointed to consider the ramifications of this association and to recommend subsequent action to the Area membership.

Charles Murray, Seattle's Traffic Signal Engineer, reported that a 13-week course in signal and controller servicing was successfully concluded on May 6th. Thirty (30) men from the Puget Sound Area attended a total of 78 course hours in the Seattle Signal Shops and a high degree of satisfaction was expressed by those attending and their respective organizations.

Gene Ireland reported that the Industrial Lighting Seminar held in Seattle on April 27th was considered highly successful. Approximately 120 people interested in developments in street lighting attended.

Dennis Crumley, University of Washington graduate student working with Professor Roy Sawhill on an economic study of truck transportation, gave as a technical topic a resume with accompanying slides of this study which is now underway. He told of the technical problems encountered in the gathering of data and presented some of the preliminary findings and indications.

Inter-Mountain Area

Our congratulations to Don Bass, Bob O'Connell's Assistant, who was recently accepted into Membership in the Institute; also to John Bradley and Bob Chester on their transfer to Associate Grade.

Thirteen Members and sixteen guests assembled in Cheyenne on June 5th for the last quarterly meeting of the Inter-Mountain Area for the 1958-59 year. Most of the out-of-towners arrived in time to tour the recently completed Wyoming Highway Department Building and a portion of the Inter-State Highway, which passes directly by the new building. Wyoming is to be congratulated on this new Highway Department Building. It is one of the most modern and well equipped buildings to be found in this area.

At the conclusion of the field trip, we adjourned to the Hitching Post for our social hour and dinner meeting. Following a welcome by Bob O'Connell, and the introduction of all Members and guests, the meeting was turned over to Chairman Hudspeth who conducted the business portion of the evening's events. This consisted mainly of a report on the discussions relating to district boundaries, Al Pepper's report of the Exploratory Committee on the 1962 Convention, and matters which would be brought up at the Section Convention in Seattle. John Bradley spoke briefly of the Past President's Award, noting the articles which have appeared in "Traffic Engineering" by Western Section Members during the past year, and asking for assistance in selecting the year's Western Section Annual Award Winner. All Area Members are invited to review the articles which have been written by Western Section Members during the past year and forward their comments to John Bradley.

At the suggestion of the Denver Metropolitan Safety Council, we discussed the possibilities of forming a Metropolitan Traffic Engineering Group, composed of all people associated with traffic engineering, regardless of their ITE affiliation. It was

generally agreed that this would be a worthwhile venture and plans are being undertaken to formulate this group.

Following this, the election-railroading of the Area Chairman was conducted. Bob O'Connell was nominated as Area Chairman by Jack Shockey. Al Pepper seconded the nomination. Bill Tucker moved the nominations be closed, and a unanimous ballot was cast for Bob O'Connell. At this point, the meeting was turned over to O'Connell.

Bob's first official act was to introduce his Assistant, Don Bass, who acted as Panel Leader for the program. The other panelists were: Al Pepper, Traffic Engineer for the State of Colorado and Bob Meyer, Traffic Engineer for Nebraska. The discussion centered around the increased speed limits in adjacent states with regard to signing, enforcement, etc. Those wishing a detailed resume of the discussion may secure it from Vealess Hudspeth. Following the panelists, we were privileged to receive comments from Neil Boyd, Safety Director of the Wyoming Highway Patrol, and Lt. Moore of the Cheyenne Police Department. As has been the case in the past, this was an extremely successful meeting and it is hoped that Bob O'Connell can continue the pattern which he and the others have set during the past year.

Both the Colorado Department of Highways and the City and County of Denver were elated recently upon receiving word from President Sielski that they were recipients of certificates of recognition for proficiency in traffic and highway engineering.

Al Pepper journeyed to Chicago this month to attend a meeting of the AASHO Sub-committee on Interstate Sign Manual changes. Al and George Webb are the two Western Representatives on this committee. Al also informs us that Colorado's new 70 MPH speed limit signs will be of the bold Interstate 4 ft. x 5 ft. size.

Jack Shockey underwent an appendectomy on June 18th at St. Joseph's Hospital in Denver. At press time he was reported coming along fine and eager to return to his work.

June 18th also marks John Burg's return to the office after quite an absence due to illness.

San Diego Area

The City of San Diego has announced the reorganization of its Transportation and Traffic Engineering Departments. Jim Reading, former City Traffic Engineer, has been promoted to the newly created position of "County-Wide Traffic Safety Co-Ordinator"; with the rise of traffic fatalities this year, we are sure that this will keep Jim jumping. Ed Hall has assumed the duties of "Transportation and Traffic Engineering Director" and Marty Bouman as "Traffic Operations Engineer."

Other I.T.E. members assignments are as follows:

Don Robbins—
Operations and Investigations
Chuck Strong—Surveys and Records
John Tsiknas—Traffic Design
Keith Gilbert—
Advance Transportation Planning Team

Letter to the Editor

Dear Sir:

It is a well known fact that the sale of so called "small cars" has been of significant volume during the past year, and that the demand for this type of car seems to be increasing.

Because of the low horse-power and weight of these small cars, they use much less gasoline per mile than the conventional passenger cars. This fact is of concern to the State Highway Commission in North Carolina and in all other states, since the basic financial support for highway construction and maintenance is the Gasoline Gallon Tax.

The writer has not observed any reliable data as to the extent of use of these "small" cars as they appear in the traffic stream. To determine this in North Carolina, the Planning Department of the State Highway Commission arranged for its regular traffic count men to make special tallies of these small vehicles during the month of April 1959 at all their scheduled counting points, all over the state. The resulting data may be used, not only to determine the April small car percentage, but similar observations may be made at later dates to evaluate the trend of use of these cars, and their impact on gasoline tax revenues.

Observations of 8 hours each were made on 857 scattered road segments in 58 of the state's 100 counties. A grand total of 658,000 passenger cars were classified. All counts were made outside cities and towns. Both day and night observations were made, including weekend days as well as weekdays, as the regular schedule happened to direct.

No attempt was made to define the "small car" exactly, it being left to the discretion of the observer to make the classification as the vehicle moved by him at road speed. It is realized that some small but high-powered sports cars may have been included for this lack of definition and difficulty in classification.

The April data have been analyzed as to section of state, system of highways, and whether on paved or unpaved roads. The summary is presented in percentages in the accompanying table.

It is apparent from these data that the incidence of the small car is not of serious proportion in terms of gasoline tax revenue. Passenger cars contribute only about 65% of the North Carolina gasoline tax revenue, the others being trucks and busses. With small cars being only about 2.63% of the total passenger cars in the composite traffic stream, and with their gasoline consumption per mile being merely reduced below that of the standard car, the likely revenue loss due to the small car is in the order of only about eight-tenths of 1% of the total gasoline tax revenue. This is so small as to be almost negligible, and could possibly even be off-set by increased total miles of travel associated with the purchase and use of the small car. Further statistical refinements could be made from the available data, but would not appear to be justified at this time. Further observations of a similar nature will be made about six months later.

It is noted from the table below that the higher percentages of appearance of the small car are (1) on Primary State Highways and (2) in the central part of the state. The latter is the high population, highly industralized section where the majority of the cities and colleges are found. There is some evidence that higher percentages than revealed by this survey would be found in the cities, and especially in some sections of the cities.

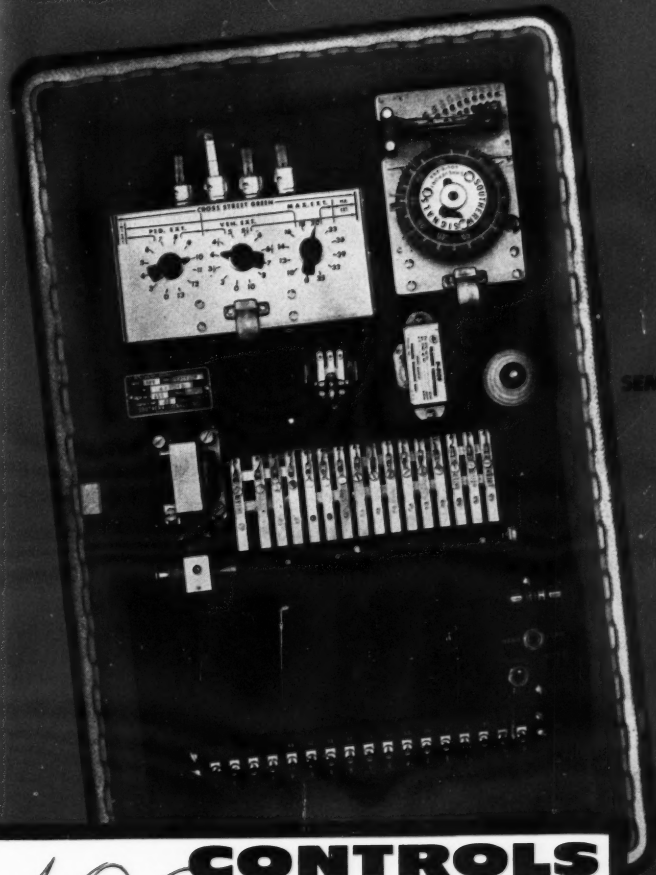
There is little difference in the small car percentage during the three 8-hour segments of the 24-hour day. This would indicate that the small car is replacing the conventional type for all purposes at about the same extent in highway travel, i.e., for work, business and pleasure.

Sincerely,
James S. Burch
Planning Engineer
North Carolina State
Highway Commission

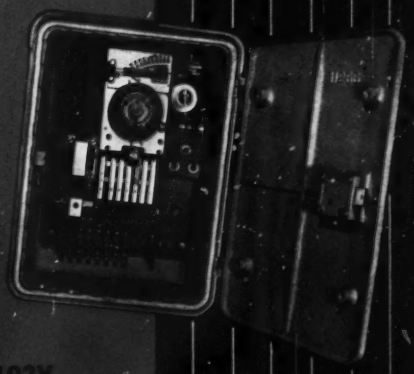
Percentage Small Cars of all Passenger Cars

	Eastern Divisions 1,2,3,4,6	Divisions Central 5,7,8,9,10,12	Divisions Western 11,13,14	Total State
Primary State Highways	2.58	3.08	2.28	2.72
Paved Secondary Roads	1.89	3.33	1.50	2.48
Unpaved Secondary Roads	0.45	1.10	1.26	0.88
All	2.52	3.10	2.22	2.63

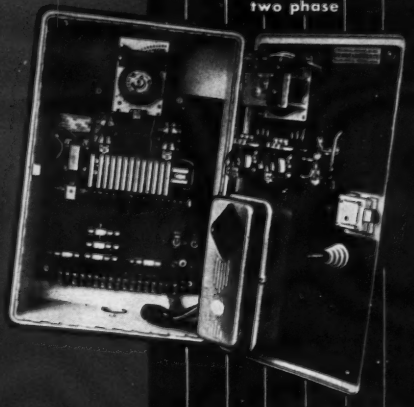
AUTOFLOW



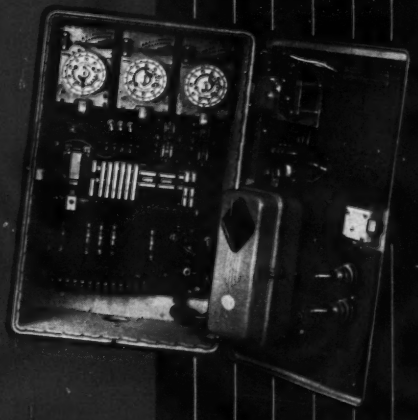
102V
SEMI-ACTUATED



1025 — 6 CIRCUIT
single timer
one to three program
two phase



102L-NX NON-EXPANSIBLE
single timer
one to three program
two or multi phase



102L-XP EXPANSIBLE
one to three timers
two or multi phase

CONTROLS
102 for Traffic Signals

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BULLETIN 3702

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FLUORESCENT
New Poly-Cones and All-Rubber cones available in brilliant orange-red fluorescent for extra brilliance, day or night.

SAFE-T-CONES made only by **Radiator Specialty Co.**
Charlotte, N. C.

Membership Applications

The Institute of Traffic Engineers welcomes applications from qualified traffic engineers, but does not desire as members persons who are unqualified. Listed below are the names of those from whom applications for membership or transfer in grade have been received since the last published list. Institute members are urged to review this as soon as possible and immediately inform the Executive Secretary's office if names of people are found who are known to be unqualified for ITE membership or transfer.

NEW APPLICATIONS

BOORMAN, Arthur Gordon
Senior Engineer, Messrs. Scott & Wilson, Kirkpatrick & Partners, Consulting Engineers, 47 Victoria Street, London S. W. 1, England. June 5, 1959 for MEMBER.

GONZALEZ-SOLER, Luis
Traffic Analyst, Parsons, Brinckerhoff, Hall & Macdonald, 165 Broadway, New York 6, New York. June 26, 1959 for ASSOCIATE.

HUFFMAN, Bertram McClure
Traffic Engineer, City, City Hall, Edmonton, Alberta, Canada. June 5, 1959 for ASSOCIATE.

KOHN, Melvin Jay
Traffic Engineer, Report Department, Parsons, Brinckerhoff, Hall & Macdonald, 165 Broadway, New York 6, New York. June 26, 1959 for ASSOCIATE.

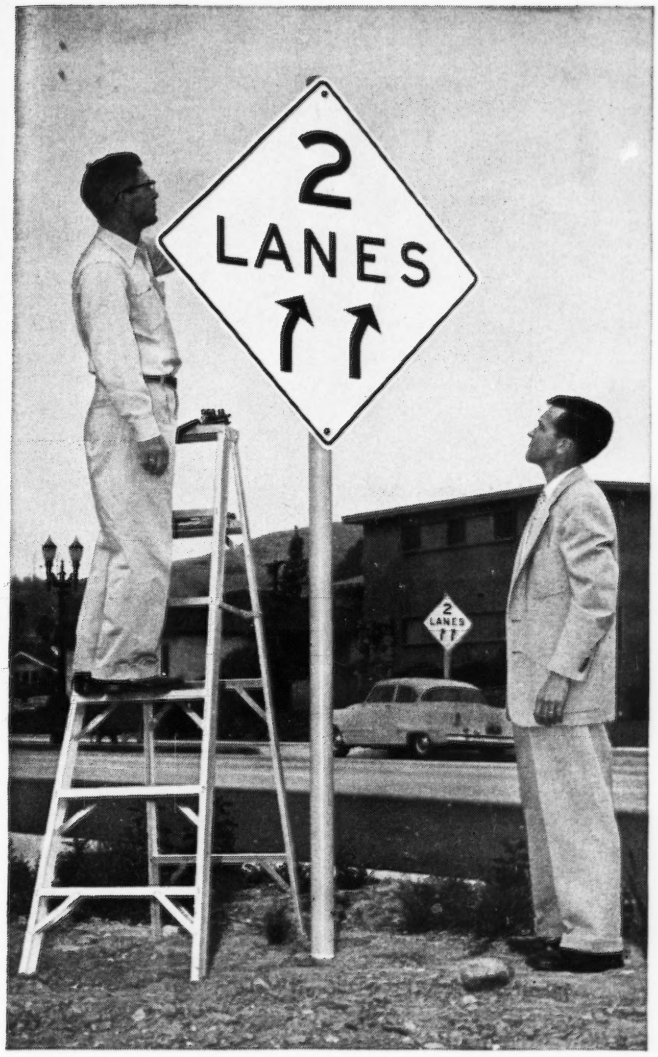
LONG, Peter
Assistant to Engineer i/c Transportation Engineering, Traffic Division, City Engineering Department, City Hall, 453 West 12th Avenue, Vancouver 10, B. C., Canada. June 16, 1959 for JUNIOR.

NOBLITT, Jack Lee
Traffic Survey Engineer, Utah State Road Commission, 525 West 13 South, Salt Lake City, Utah. June 18, 1959 for JUNIOR.

RAUS, Juri
Junior Highway Engineer, Connecticut State Highway Department, 24 Wolcott Hill Road, Wethersfield, Connecticut. June 22, 1959 for JUNIOR.

TAYLOR, Grady Joe, Jr.
Highway Engineer, Howard, Needles, Tammen & Bergendoff, Consulting Engineers, 1805 Grand Avenue, Kansas City 8, Missouri, June 1, 1959, for ASSOCIATE.

(Continued on page 40)



Lightweight, easy-handling aluminum signs go up fast. While R. J. Colpitts looks on, foreman Omer Lane easily installs this sign in only 10 minutes. Alhambra's signs are fabricated from Kaiser Aluminum blanks with reflectorized sheeting by the Mask-Off Company of Monrovia, California.

"For our money, only cost-saving aluminum signs will do!"

... says R. J. Colpitts, Traffic Engineer, Alhambra, California

"We like aluminum traffic control signs because we are able to get the type of sign we want—with both initial and long range savings over other materials," reports R. J. Colpitts, Traffic Engineer, Alhambra, California.

"And we know we'll save plenty on maintenance and replacement costs, as well. With rustproof aluminum, the oxidation problem is reduced to an absolute minimum. There's no need for us to protect the edges and back surfaces of our signs.

"What's more, because aluminum signs are so easy to work with, they give our sign shop greater flexibility. We can tailor-make our sign program to suit our particular needs with little added equipment.

"No doubt about it. With us, it's aluminum traffic control signs all the way!"

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Paul H. Callender Co.
Chicago, Ill.
Bell & Gustus, Inc.
Federal Sign & Signal Corp.
Spencer, Ind.
Stello Products
Cleveland, Ohio
Osco Steel Co.
U. S. Steel Supply
Clinton, Mass.
Standard Sign & Signal Co.
Dallas, Tex.
All Quality Sign & Mfg. Co.
Elmira Heights, N. Y.
Eastern Metals of Elmira, Inc.
Evanston, Ill.
Northwest Screenprint Co.
Grand Prairie, Tex.
Sargent-Sowell, Inc.
Houston, Tex.
Western Sign & Supply Co.
Indianapolis, Ind.
Midwest Fire & Safety Equipment Co., Inc.
Lancaster, Pa.
John I. Nissly Co.
Little Rock, Ark.
Moody Equipment & Supply Co.
Marion, Ind.
Jim Newey and Assoc.
Metairie, La.
W & A Engineers
Miami, Fla.
Biscayne Fire Equipment Co.
Minneapolis, Minn.
Lyle Signs, Inc.
Monrovia, Calif.
Mask-Off Co.
North Tonawanda, N. Y.
Northern Electric Supply Co.
Overland, Mo.
Wiegand Mfg. Co.
Peoria, Ill.
James P. Flynn Co.
Petaluma, Calif.
Kresky Signs, Inc.
Philadelphia, Pa.
Advertisers Service Co.
Rocky River, Ohio
Bowman Western Stamping Co.
Sacramento, Calif.
The Dosch Co.
St. Louis, Mo.
Parco Supplies
St. Paul, Minn.
Gopher Stamp Co.
Tacoma, Wash.
Traffic Control Signs Co.
Wichita, Kan.
Miro-Flex, Inc.
Williamsville, N. Y.
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Oakland 12, California

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NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

MEMBERSHIP APPLICATIONS

(Continued from page 38)

APPLICATIONS FOR TRANSFER

CRAMER, Myron F.
Associate Highway Electrical Engineer, State, Department of Public Works, Division Highways, District I, P.O. Box 1012, Eureka, California. June 20, 1959 for ASSOCIATE.

FORSTER, John Lawrence
Acting Traffic Control Engineer, Department of Highways, Ontario, Parliament Buildings, Toronto, Ontario, Canada. June 24, 1959 for ASSOCIATE.

JENNI, Marcel Jean
Traffic Engineer, City of Zurich, Detm, of Public Works, Werdmuhleplatz, Zurich 1, Switzerland. May 22, 1959 for ASSOCIATE.

WELLONS, William Benjamin Jr.
Traffic Engineer, City, 405 Biltmore Way, Coral Gables 34, Florida. June 9, 1959 for ASSOCIATE.

Yearbook Changes

BARKLEY, Robert E. (Associate)
Executive Director, Redevelopment Commission of Greensboro, Room 505—Banner Building, Greensboro, North Carolina.

BARTELS, William J. (Junior)
Traffic Planning Engineer, City, Municipal Building, White Plains, New York. WHite Plains 9-4800. SEND MAIL: 131 Coligni Avenue, New Rochelle, New York.

BIDELL, William (Junior)
Priorities Engineer, Ontario Dept. of Highways, Parliament Buildings, Toronto, Ontario, Canada. EMpire 3-1211, Local 2164. SEND MAIL: 108 Three Valleys Drive, Don Mills, Ontario, Canada.

CORGILL, William E. (Associate)
Traffic Engineer, Wilbur Smith & Associates, Room 305, 608 Tampa Street, Tampa, Florida. TAmpa 2-2071. SEND MAIL: 4901 Oak Hill Road, Columbia, South Carolina.

CRANE, Herbert L. (Junior)
Assistant District Traffic Engineer, Pontiac District, Michigan State Highway Department, 926 Featherstone, Pontiac, Michigan, FEderal 3-7801.

CZYZ, Iwan (Junior)
Traffic Engineer I, Bureau of Traffic Engineering, 1002 City Hall Annex, Philadelphia 7, Pennsylvania. MUnicipal 6-9700, Ext. 698. SEND MAIL: 5217 North 8th Street, Philadelphia 20, Pennsylvania.

FRAENKEL, Joseph A. (Member)
Chief Traffic Engineer, Ministry of Communications & Transportation, 29 Yehoudah Hayamit Jtr., Tel-Aviv—Yafo, Israel. Tel-Aviv 81351. SEND MAIL: 13, Vitkin Street, Tel-Aviv, Israel.

FRINK, Leslie M. (Junior)
Traffic Engineer, City, Box 1440, Santa Barbara, California. WOodland 6-7171, Ext. 76.

GALLAGHER, John L. Jr. (Associate)
Chief Traffic Engineer, City, City Hall Annex, 67 N. Front Street, Columbus 15, Ohio. CApital 1-2211, Ext. 332.

GRAHAM, Keith W. (Junior)
Assistant Traffic Engineer, Traffic Engineering Division, City, Wichita, Kansas. SEND MAIL: 1313 Dallas Avenue, Wichita 13, Kansas.

JACKS, Marshall Jr. (Junior)
Sr. Assistant Traffic Engineer, Dept. of Streets & Traffic, 735 Randolph Street, Detroit 26, Michigan. WOodward 3-5303.

JENNI, Marcel J. (Junior)
Schwellistrasse 17, Zurich 52, Switzerland.

KAISER, John (Junior)
Assistant Civil Engineer, New York City Department of Traffic, 100 Gold Street, New York 38, New York. SEND MAIL: 5-22 117th Street, College Point 56, N. Y.

McLEROY, Charles E. Jr. (Junior)
Senior Traffic Engineer, City, P.O. Box 1662, Corpus Christi, Texas.

MILLER, Edwin H. (Junior)
District Traffic Engineer, Michigan State Highway Dept., 407 County Bldg., Kalamazoo, Michigan. FIreside 3-2528.

TRAUTMAN, James F. (Associate)
Traffic Engineer, Tippetts-Abbett-McCarthy-Stratton, 375 Park Avenue, New York 22, New York. PLaza 5-2000.

VON EHRENKROOK, William H. (Associate)
Traffic Engineer, Traffic Design Section, New Mexico State Highway Dept., P.O. Box 1641, Santa Fe, New Mexico. YUcca 3-7381, Ext. 316.

OVERHEAD SIGNING

(Continued from page 15)

traffic operation, it is wise to provide for sign readability even during the short periods when illumination may fail. Reflective message copy with proven durability would enhance the value of the installation.

3. Dual tube fixtures, although not essential for proper illumination of the signs in this case, will reduce the overall cost of maintenance. Fluorescent tubes and ballasts are dependable units but may fail at anytime. The failure of either tube in a dual tube fixture will cause a reduction of available light on the sign face in front of the fixture, but will continue to have sufficient illumination for good readability. The burnt out unit can then be replaced at the scheduled replacement date without need for emergency replacement which is very costly.

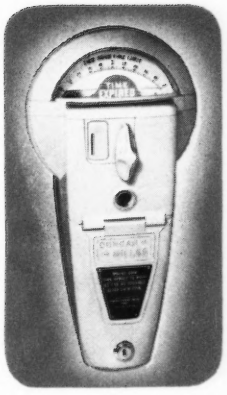
Sign illumination fixtures are frequently supplied with bi-tube ballasts. Care should therefore be taken to require that a single ballast does not fire both tubes in the same fixture. If this precaution is not taken, a ballast failure will result in a blackout of an entire fixture nullifying the advantage of the twin tube fixture. We have also found it advantageous to power the fixtures with three wire incoming service. The fixture wiring is such that the tubes in any fixture not only are powered by separate ballasts, but are also on a different circuit. Thus, a short or other failure in one circuit leg will only cause the loss of illumination from one tube in each fixture. This, of course, is an added safety factor for insuring the dependability of the installation.

Figure 4
Closeup view of left column support and bumper block protection for columns. Detail also indicates support of lighting fixtures from the bottom of truss. Fixtures partially block message copy as photo was taken at closer than normal viewing distance. Sign copy used is identical to AGA standard.

4. Maintenance of traffic control devices, including signs, which require physical interference with normal traffic operations not only adds to the total cost of maintenance but in most instances is an avoidable hazard to the work crews and the traveling public. The frequency and duration of the interference should be carefully weighed against the cost of providing means of maintenance that does not cause this disturbance.

In the case of a sign bridge installation, consideration should be given for provision of a man walkway along the base of the sign bridge. From this position maintenance of the sign face, fixtures, wiring and ballasts is possible without interference to traffic. The value of the installation is thereby assured for many years without hazard to traffic and at the lowest possible maintenance cost.

Imitated ..but never duplicated



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Positions Available

SPRINGFIELD, MISSOURI

Position: Traffic Engineer.

Requirements: Qualified through training and experience to perform technical work in regard to preparation of plans and specifications in the control of vehicular and pedestrian traffic flow. Work involves supervision of subordinate employees. Experience may be substituted for some college credit.

Salary: Start, approximately $5,800.

Apply: Send resume, stating starting salary requirements to Personnel Department, City Hall, Springfield, Missouri.

DULUTH, MINNESOTA

Position: Traffic Engineer—to perform professional technical and administrative work in directing City Traffic Engineering Bureau.

Requirements: B. S. in Engineering from an accredited college with some specialized training in traffic engineering preferred; plus minimum two years' responsible experience in traffic engineering.

Salary: $7,032 to $8,556 per year.

Apply: Secure application from the Office of Civil Service Board, 402 City Hall, Duluth, Minnesota.

SPRINGFIELD, MASSACHUSETTS

Position: Traffic Engineer to plan and supervise all traffic engineering and traffic engineering functions; designs for physical improvements; traffic counts; pavement markings; pedestrians; accidents; signal light planning, installation, operation nad maintenance. INDEPENDENT CITY DEPARTMENT.

Requirements: Not less than twenty-five years of age, graduate of a recognized traffic engineering school; must have been engaged in the practice of traffic engineering for a minimum of three years and for at least one year of this period shall have been in responsible charge, or, shall be an experienced traffic engineer having served in that classification in a city of 50,000 or more population for a period of at least five years.

Salary: $8,138 to $9,261 with many fringe benefits.

Apply: Reply by letter to Mayor Thomas J. O'Connor, Jr., c/o City Hall, Springfield, Massachusetts. Include all training and experience and at least three references. All applications will be kept confidential.

CITY OF WINNIPEG, MANITOBA

Position: Assistant Traffic Engineer.

Requirements: Minimum 3 years' experience in traffic engineering work.

Salary: Open.

Apply: Personnel Manager, 160 Princess Street, Winnipeg 2, Manitoba. State salary requirements.

KANSAS CITY, MISSOURI

Position: Two Associate Traffic Engineers, to plan, supervise and participate in major technical traffic engineering studies and projects. Wide latitude for individual judgment. Minimum three years' experience. Engineering degree desirable, preferably with course in traffic. Additional experience may be accepted in lieu of degree.

Salary: $505 to $675 per month. Starting salary at any step in the range depending upon qualifications. Merit system tenure.

Apply: City Personnel Department, City Hall, Kansas City 6, Missouri.

GLENDALE, CALIFORNIA

Position: City Traffic Engineer, has top administrative and technical responsibility for traffic engineering section under Director of Public Works.

Requirements: Graduate civil or traffic engineer, and 5 years professional civil engineering experience of which 3 must have been in traffic.

Salary: $679-$840 per month. Starting salary may be set above minimum.

Apply: Glendale Civil Service Office, City Hall, Glendale, California.

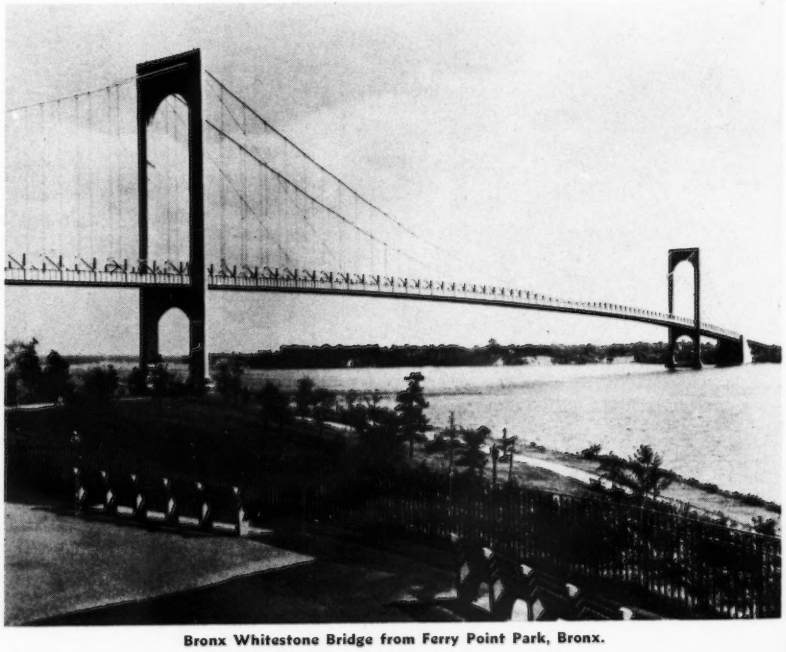
BUILDING FOR TRAFFIC

(Continued from page 13)

Actually we are in the midst of a $2-billion metropolitan arterial program, much of which has already been completed. The total amount so far expended for finished construction approximates $470-million, and $310-million in additional contracts are in progress. Slightly more than $1-billion in arterials and bridges are under design, and future projects expected to cost $175-million will be placed under design as soon as the current program is further advanced. During the past year we committed $115-million in 90-10 federal-state funds for projects within New York City.

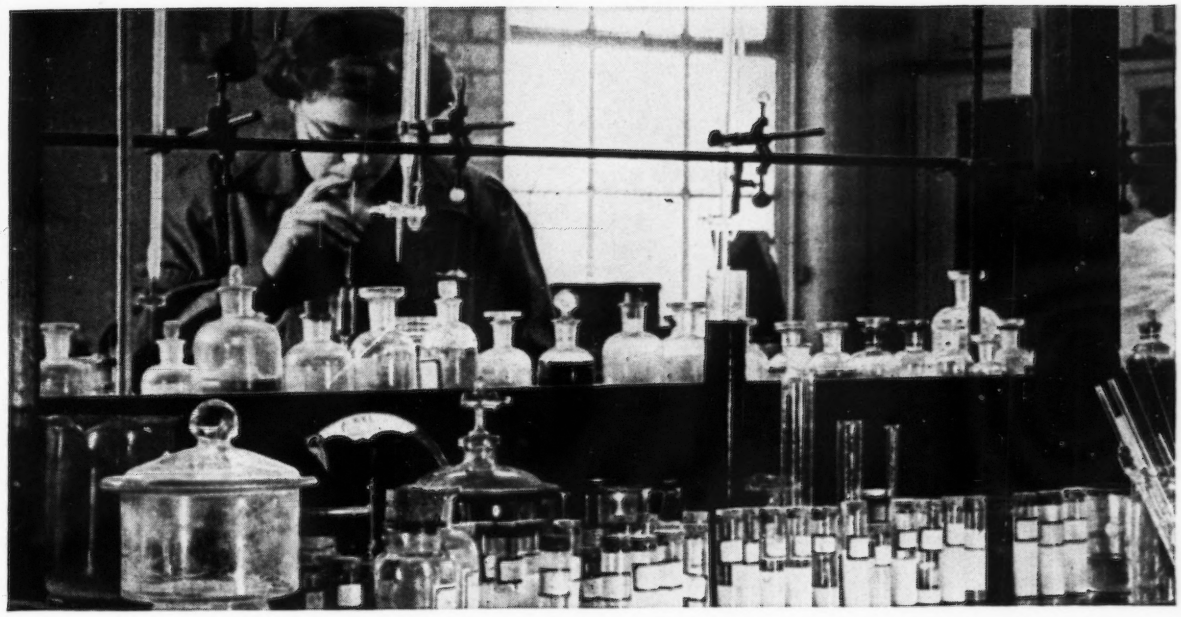
To keep the press, public and government informed, a quarterly report on the metropolitan arterial construction program is published and widely distributed. In it we list projects which are part of the complex of arterials. We use charts, maps, photographs and drawings to indicate the cost, starting date, completion date, point of progress, designers, contractors and the supervising agencies. Most of this construction is being financed with 90 per cent federal and 10 per cent state money, including the extensive connecting highways beyond the immediate approaches to the bridge projects. The bridge facilities are being financed by the two authorities on a self-supporting basis.

When completed, this program will give metropolitan New York the best network of arterials and traffic facilities in the world, prevent total strangulation of the area, and enable the community to keep pace with the mounting passenger and industrial traffic of the future.



Bronx Whitestone Bridge from Ferry Point Park, Bronx.

THE U. S. TREASURY SALUTES THE CHEMICAL INDUSTRY



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MOTOR VEHICLE DEATHS AND CHANGES

Month	DEATHS 1956	1957	1958	1959	CHANGES 1956-1959	Last 12 Months 1957-1958	1958-1959	4 Months Moving Ave.* '57-58	'58-'59
January	2,954	2,882	2,770	2,880	— 3%		+ 4%		0%
February	2,652	2,508	2,360	2,410	— 9%		+ 2%		— 1%
March	2,940	2,843	2,560	2,790	— 5%		+ 9%		+ 2%
April	2,970	2,933	2,580	2,610	—12%		+ 1%		+ 4%
May	3,094	3,065	3,010	3,250	+ 5%		+ 8%		+ 5%
5 Mos.	14,610	14,231	13,280	13,940	— 5%		+ 5%		
June	3,338	3,302	3,000			— 9%		— 8%	
July	3,555	3,308	3,210			— 3%		— 6%	
August	3,535	3,635	3,450			— 5%		— 5%	
September	3,653	3,365	3,330			— 1%		— 5%	
October	3,476	3,466	3,600			+ 3%		— 1%	
November	3,603	3,620	3,510			— 4%		— 1%	
December	3,858	3,775	3,620			— 3%		— 1%	
Total	39,628	38,702	37,000						

*Four Months Moving Average is based on changes between the totals for four months instead of one month. For example, the April figure shows the change between the totals for January-April 1958 and January-April 1959, etc. Adding several months together tends to smooth out single month changes which may be affected by differences in the number of weekends in a month from one year to the next, random variations, etc.

All 1956 and 1957 figures are from the National Office of Vital Statistics.
The 1958 and 1959 figures are National Safety Council estimates.

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(Continued from page 24)

Motorists' Services On Freeways

Milton C. Taylor, Associate Professor of Economics of Michigan State University, writing in "Land Economics" February 1959 states:

"The most comprehensive single study of service needs on limited-access highways was undertaken on the Ohio Turnpike. This research project found that 20 to 30 per cent of all motorists stopped at service areas on short trips of less than 50 miles. On trips of 70-90 miles, approximately 50 per cent stopped; while the percentage of motorists visiting service areas continued to rise until practically all cars stopped on trips over 200 miles. For all vehicles and for the average trip of 70 to 90 miles, 34 per cent stop for food, 28 per cent for the use of restrooms, and 21 per cent to buy gasoline. Once on the turnpike the motorist tends to stay on until his trip is completed; on trips of around 225 miles, only about 1.5 per cent of the motorists leave the highway to buy fuel, while 6 per cent leave for food.

"There is a great deal of information in the Ohio report, but it still represents merely a beginning of the research that needs to be done. More information is desirable on the number of motorists leaving the highway for services relative to the number using service areas. These data need to be obtained for various distances of trips and for rural and urban segments of the highway. Tests could also be run to determine the time and cost involved in obtaining services off the right-of-way as compared to obtaining them on the roadside. Public reaction could be obtained in order to determine the preference of highway users. Comparisons may be made of prices and quality of services on and off the right-of-way. All of these areas of research should be undertaken in different areas of the country and on different types of limited access highways. Research of this magnitude would appear to be entirely justified when it is recalled that over $50 billion will be spent on the interstate highway system and the provision of services is an integral and important aspect of the efficiency and convenience of the system.

"One other difficulty, aid to disabled vehicles, deserves at least brief mention because it is related to the provision of service facilities on the roadway and its resolution also raises the issue of the regulation and supervision of private enterprise.

"Aid to disabled vehicles is a different problem than the physical location of service facilities, because a motorist with a disabled vehicle on a limited-access highway must be assisted regardless of whether service facilities are provided on or off the right-of-way. At the same time, however, the issue is related to the location of service facilities. For example, when service areas are located on the right-of-way, contracts to patrol the facility may be given to oil companies which have concessions on the right-of-way. Or again, the problem of disabled vehicles is related to the location of service areas because it is possible that the incidence of disablement will be lower when service areas are located on the roadside. This assumption is based on the argument that motorists would be less inclined to take a calculated risk of continuing their trips when they are low on gasoline or aware that their automobiles require attention if highway services were located on the right-of-way.

"Aid to motorists in distress is a major activity of modern toll highways. Experience has shown that an appreciable number of vehicles run out of gasoline or have mechanical difficulty when the drivers are many miles from the nearest location where assistance may be obtained. Typical are the statistics of the New York Thruway Authority which in 1956 gave assistance to 66,540 disabled vehicles. Out of this total, 20,044 vehicles had run out of gasoline, 13,874 had tire trouble, and 13,000 required a tow.

"The toll highways have resolved the problem by providing regular police patrols, which in turn make arrangements for the removal of the vehicles. But toll highway administrators have found that unregulated private enterprise cannot be entrusted to remove these vehicles. They have found not only that many firms lack experience, equipment, or adequate insurance, but that there is a general tendency for the garages to overcharge the public. As a result, the standard procedure on toll highways is for only authorized garages to be allowed on the highways.

"Even without going into the problem of disabled vehicles comprehensively, two tentative conclusions appear warranted. In the first instance, fast and efficient service for disabled vehicles appears to be necessary if the public roads are to approach the standards of convenience and safety developed on toll highways. Secondly, experience to date with extended stretches of limited-access highways shows that the problem of disabled vehicles can be resolved best through the combination of patroling by state police and the removal of vehicles by authorized and supervised garages."

World Bank's Biggest Road Loan to Iran

The World Bank's largest loan for highways, (US) $72 million, was made to Iran on May 29.

The sum will help finance the construction or reconstruction of 1,500 miles of main roads in western and southern Iran, the improvement of a 270-mile link connecting important Shiraz Province with the Gulf ports of Khorramshahr and Bandar Shapur, and the planning and preliminary engineering of feeder roads and main roads to be included in Iran's next highway program.

The Iranian Plan Organization, the nation's economic development agency, is responsible for the work being undertaken with the World Bank's $72 million loan.

The Plan Organization also is responsible for the engineering of main and feeder roads to be included in Iran's next road program. Consulting engineering firms are designing the roads and supervising construction.

Iran's Ministry of Roads is responsible for the maintenance of all roads in the program and for the improvement of the road linking Shiraz with the Gulf ports. The Ministry is carrying out this work, as well as strengthening its maintenance organization, in cooperation with the U.S. Bureau of Public Roads.

Total cost of the road program for which the World Bank loan was made is $185 million. The $72 million covers foreign exchange requirements and a small part of local currency costs. The program is scheduled for completion by mid-1962.

—World Highways, July 1959

One-Way Streets Aid Air Pollution Control Expert Declares

In making a proposal to the Board of Estimate of New York City to make additional avenues in Manhattan one-way, Dr. Leonard Greenburg, Commissioner of the Department of Air Pollution control stated:

"Pollution resulting from the operation of motor vehicles is one of the important sources of air pollution in New York City. Of the eight major gaseous pollutants in the New York City atmosphere, only two increased in the year 1958. These two were carbon monoxide and aldehydes. These result primarily from the operation of motor vehicles. The other gaseous pollutants in the air decreased in amount or remained constant in 1958.

"All automotive vehicles, whether gasoline or diesel, emit gases in their exhaust stream which pollute the atmosphere. These gases are irritating and toxic when present in sufficient concentration.

"The amount of exhaust gas emitted from an engine depends on several factors, two of which are the physical condition of the engine and the quality of the fuel being used. Any given automotive vehicle produces its least concentration of pollutants when it is in motion along the road. It produces twice the amount of pollution when it is slowing down for a stop, as it does when it is in motion. It produces approximately four times as much pollution when it is standing still in one spot, with the engine running, as it does when it is in motion.

"From these facts, which are very well established, it is obvious that anything which can be done to keep automobiles moving steadily along streets will result in the least amount of pollution being poured into the City air. The fewer stops and starts there are, the less will be the pollution of the atmosphere. This is the objective of the Department of Air Pollution Control.

"Traffic Commissioner Wiley has provided the Department of Air Pollution with a report prepared by his agency, which shows that the idling time of motor vehicles is reduced 65 to 70 per cent by one-way traffic operation and that stops are reduced by 65 to 72 per cent by one-way operation. It would appear evident from these data that the use of one-way traffic on the avenues of New York City, without any question, does result in lower concentration of automotive exhaust gas pollutants in the atmosphere.

"Commissioner Wiley has also prepared estimates of the savings in gasoline on First and Second Avenues, by the use of one-way traffic. He estimates that the gasoline saved is approximately 1,500,000 gallons per year. This means, when translated into terms of air pollution, an enormous reduction in the amount of pollution which ordinarily would be emitted by the use of this huge additional volume of gasoline.

"The economic and health hazards of air pollution present a problem of nationwide, indeed of worldwide importance. There is growing evidence that air pollution is a contributing cause in the increase in lung cancer and other respiratory ailments.

"Everyone is aware of the acute nature of the air pollution problem in Los Angeles. All present knowledge points to the fact that this problem is brought about primarily by automotive exhaust gases and the unfavorable meteorological conditions in the Los Angeles Basin.

"It is vital that New York City reduces the pollution of the envelope of air in which it is located. A great reduction of pollution from automotive vehicles can be achieved by reduction of stop and start traffic. This reduction of stop and start traffic is a direct result of one-way traffic using staggered signal lights. In the interests of air pollution prevention, the additional one-way avenues will be of great benefit to the health and comfort of New York citizens."

Vehicle Registrations Top 68 Million

Motor vehicle registrations in the United States during 1958 totaled 68,299,408 according to the Bureau of Public Roads. Federal Highway Administrator Tallamy noted that this was a gain of 1.7 per cent, or 1,168,337 vehicles, over the 1957 total. The 1958 total included 56,870,684 passenger cars, 270,163 buses, and 11,158,561 trucks. California had the highest total registration in 1958 with 7,013,163 vehicles; New York was second with 4,876,748.

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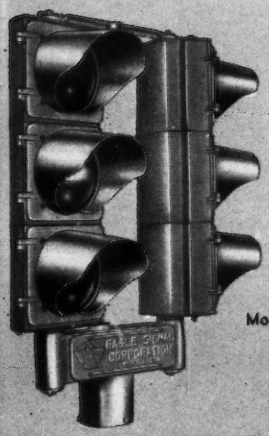

Model S23CTCH

TWO AND THREE-WAY TERMINAL COMPARTMENT SIGNALS

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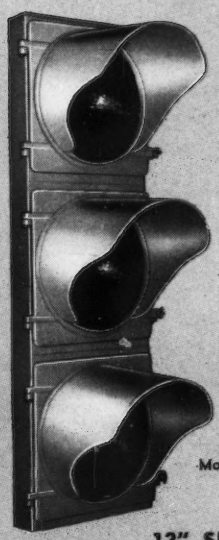
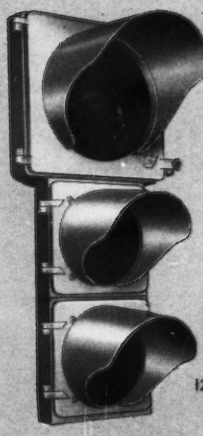


Model KB382, 12" lenses

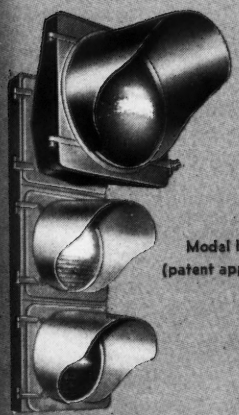


Model KB293, 12" red, 8" green and amber

12" SIGNALS

For extra long range visibility in rural and high speed highways, Eagle's extra large lenses, a full 12" in diameter, provide greater visibility for motorists. Red, Amber and Green lenses are available in either "Wide-Angle" or "Narrow-Beam" type.

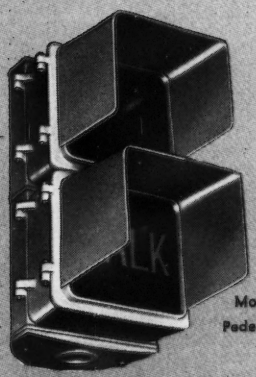
nd pedestrian signals...



Model KB331 (patent applied for)

12" SIGNAL ADAPTER

For modernizing existing traffic signals quickly and economically. Adaptable to all conventional 8" signal heads having square doors. May be installed as a 12" red at top or "arrow" indication at bottom. Dustproof — waterproof.



Model KB312 Pedestrian Signal

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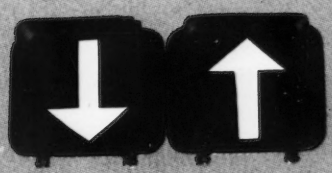

Model KB579 — 12" Square Signal

LANE SIGNALS

For use where the direction of travel in center lanes is changed at various times of the day. These signal indications are designed to be different and distinctive from regular signal indications. Illuminated backgrounds are red and green with opaque black indications. Can also be used as a pedestrian signal with large 4½" letters.

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Birmingham University Establishes Chair in Traffic Engineering

A number of interests, comprising the motor industry, certain oil companies, a group of civil engineering and surfacing contractors, the Automobile Association, the Royal Automobile Club, Lloyd's and the British Insurance Association has offered to the University of Birmingham a gift under covenants of between £19,000 and £20,000 a year for seven years for the purpose of enlarging and developing its Graduate School of Highway Engineering to include traffic engineering, and to establish a chair in the joint subjects. The donors expect the University to assume financial responsibility for the chair and the school at the end of that period. Part of the gift is intended for the provision of bursaries for graduates taking courses in the school. It is understood that the University is likely to welcome this offer, which will be formally submitted to the senate and the council this month.

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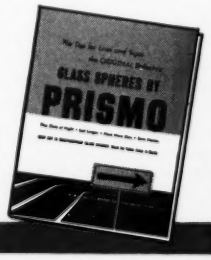

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